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COMPLEMENTARY REPORT OF RE-ASSEMBLING SEMARANG CITY:  
VOLUME 2

# CATALOG of STRATEGIES

GRADUATION THESIS  
MSC URBANISM  
TU DELFT

# Community Action Plan & Catalog of Strategies

A Strategic Framework for Semarang City:  
An Exploration of the Local Adaptive Mechanism  
in Urban Mitigation Planning

*Case Study: Kemijen, Semarang, Indonesia*

## Catalog of Strategies

*Integral part of MSc Thesis - Reassembling Semarang City*

*Delft, The Netherlands  
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Catalog of Strategies  
Integral part of MSc Thesis  
Re-assembling Semarang City

MSc Urbanism | Faculty of Architecture and Built Environment  
Delft University of Technology

*Delft, The Netherlands | May 2020*

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Catalog of Strategies

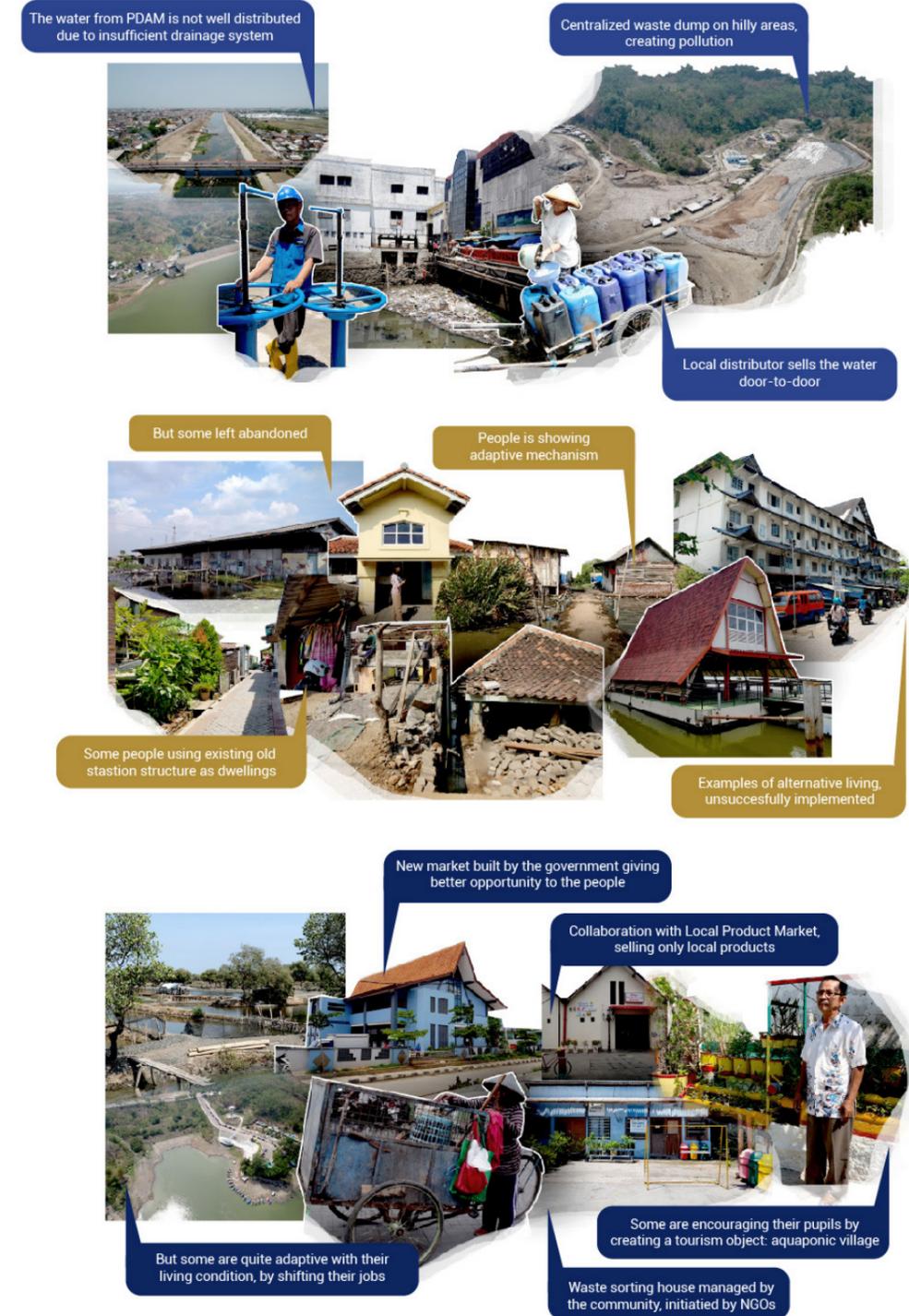
# Introduction to Catalog of Strategies

This catalog is aimed to help the community in Semarang to improve their neighborhood according to their local knowledge and aligning it to the general strategies on the city scale regarding to urban mitigation planning and for those who are interested to manage themselves and set changes to their environment which might encourage initiatives to upgrading projects. This process would start on selecting kampung and organising the local community and establishing cooperative models. It proposes strategies on the city scale (strategic framework) which will be implemented locally by the community.

This Catalogue of Strategies is not a rigid rule and regulations, and is meant to give informations and encourage the community as a source of information that can be freely implemented which contains sets of standards for healthier environment.

In this Catalogue, however, will explains the implementation on the selected kampung (as a pilot project) in Kemijen district which includes communities from Bandarharjo, Tambak Lorok, Kemijen and Kebon Harjo with the related main private stakeholders such as Tanjung Mas Port, PT Pertamina, PT Kereta Api Indonesia and public stakeholders such as Municipality of Semarang, Bappeda, PUPR and PDAM.

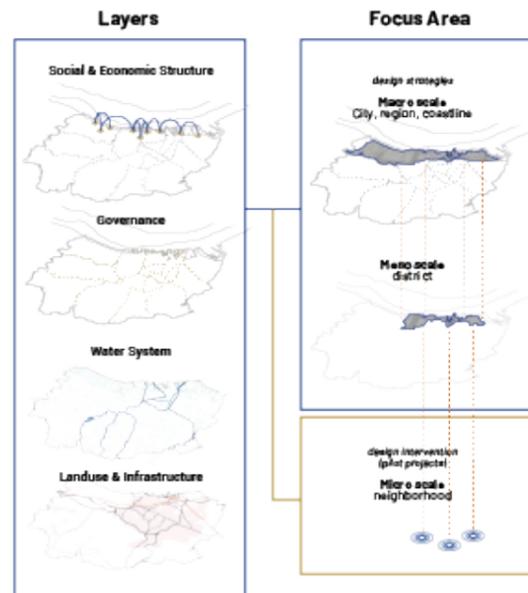
The aims of this Catalogue of Strategies is to ensure the participation of the community in the urban mitigation planning. These set of strategies derived from research, observation and analysis on the local adaptive mechanism which were presented by the local community in dealing with the flood and land subsidence issues and is translated back to a set of strategies which can be implemented by the community and is aligned to the general strategies on the city scale.



# What?

## Strategic Framework for Kemijen

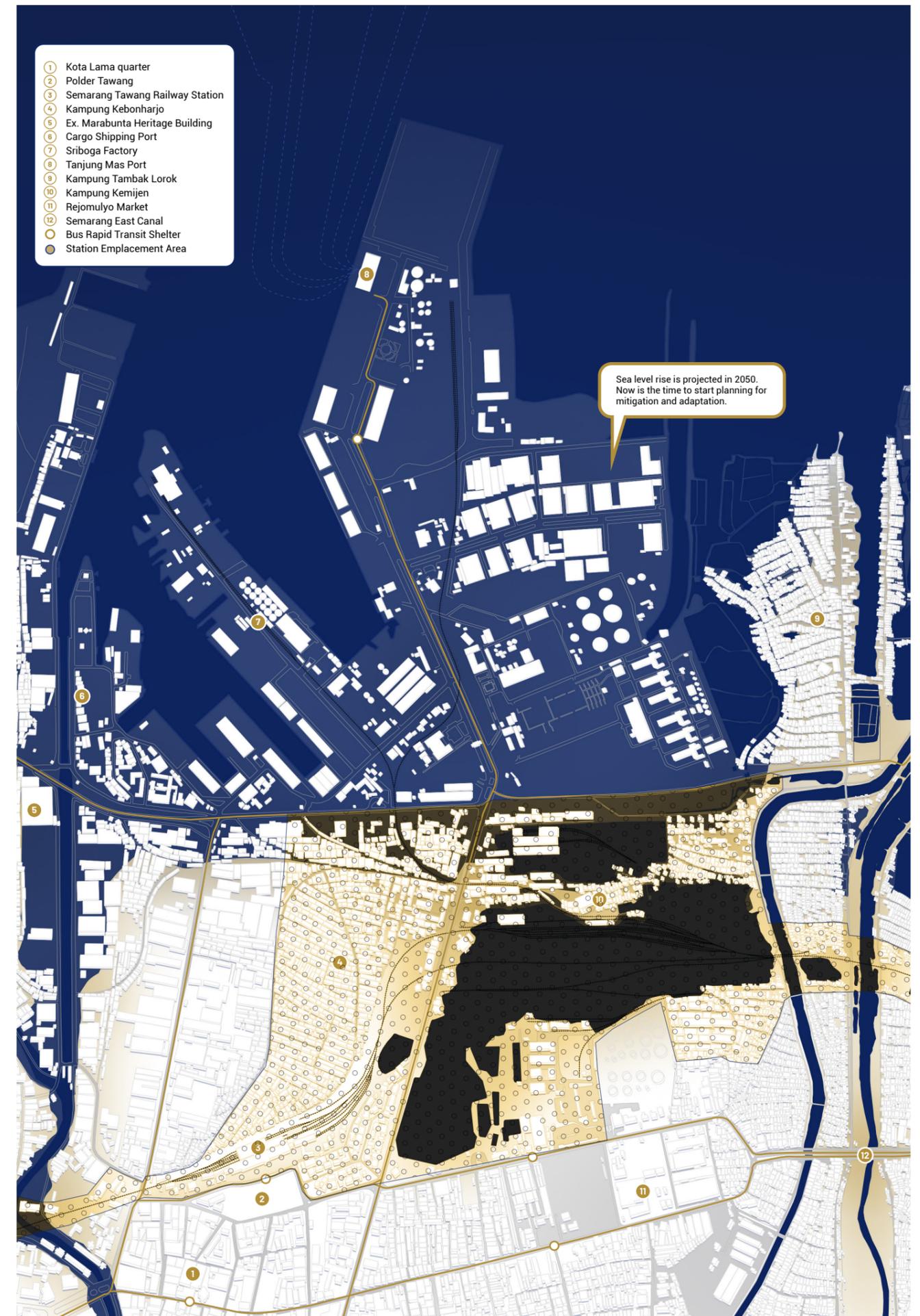
### Design Strategies (Semarang Coastline)



The strategic framework is applied within multi-scale in urban planning. The reason behind this method is to ensure the integrated urban mitigation planning between kampung, between districts and also between cities.

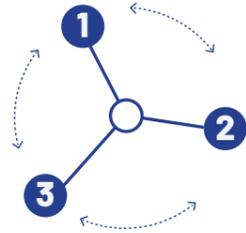
In this strategic framework, local knowledge or the adaptive mechanism presented by the local community becomes a valuable asset in the developing process. These assets are collected based on analysis obtained from observations, interviews and research in several local communities of the kampungs in Semarang, one of which is in the Kemijen district. This local knowledge presents a rather site-specific socio-cultural characteristic in which for the process of replicability analysis is needed to generalize the values and important aspects of the local knowledge (for example: local knowledge on technical methods, and socio-economic activities, behavioral patterns).

This proposal is to implement an urban transformation process which tries to emphasize and balance the soft (people empowerment) and hard (hard infrastructures) approaches through physical and non-physical layers (Socio-Economical, Governance, Water System, Land Uses & Infrastructures).



# Who?

## Inter-Relations



This strategic framework is an attempt to balance the three main stakeholders, therefore a careful consideration of city development on these interaction has to be done. In this proposal, to develop and manage the roles of each stakeholder these scheme of interaction is made. This scheme is aimed to give a structure and possible interaction between stakeholders, ensuring their assigned roles of the related project. In this scheme, it is important to notice the public participation on each proposed project.

For example, in the beginning of the scheme the community plays the big role of the proposal making (from site analysis and problems documentations) which are very valuable to understand the site situation. It is also important that in the beginning of the proposed project, the community are well informed of the real situations (site problems) as well as the possible conflict occurrences and possible collaborations with the related private stakeholders. These are very important to reduce the friction and delays on the construction process.

## Stakeholders:

### 1st Sector: Public Participation

The main stakeholder in this strategic framework is the community in which will be the main executor of the urban regeneration and improvement plan.



INDIVIDUALS



COMMUNITY/ ASSOCIATIONS

### 2nd Sector: Market Economy

This proposal tries to enable the community to be more involved in the socio-economic schemes, not only as a consumer but also the investors and producers in which aiming to unlock the opportunities to share and distributes resources more effectively.



INDUSTRIES



SMALL-MEDIUM ENTERPRISE



LOCAL BUSINESS

### 3rd Sector: Government & Private Sectors

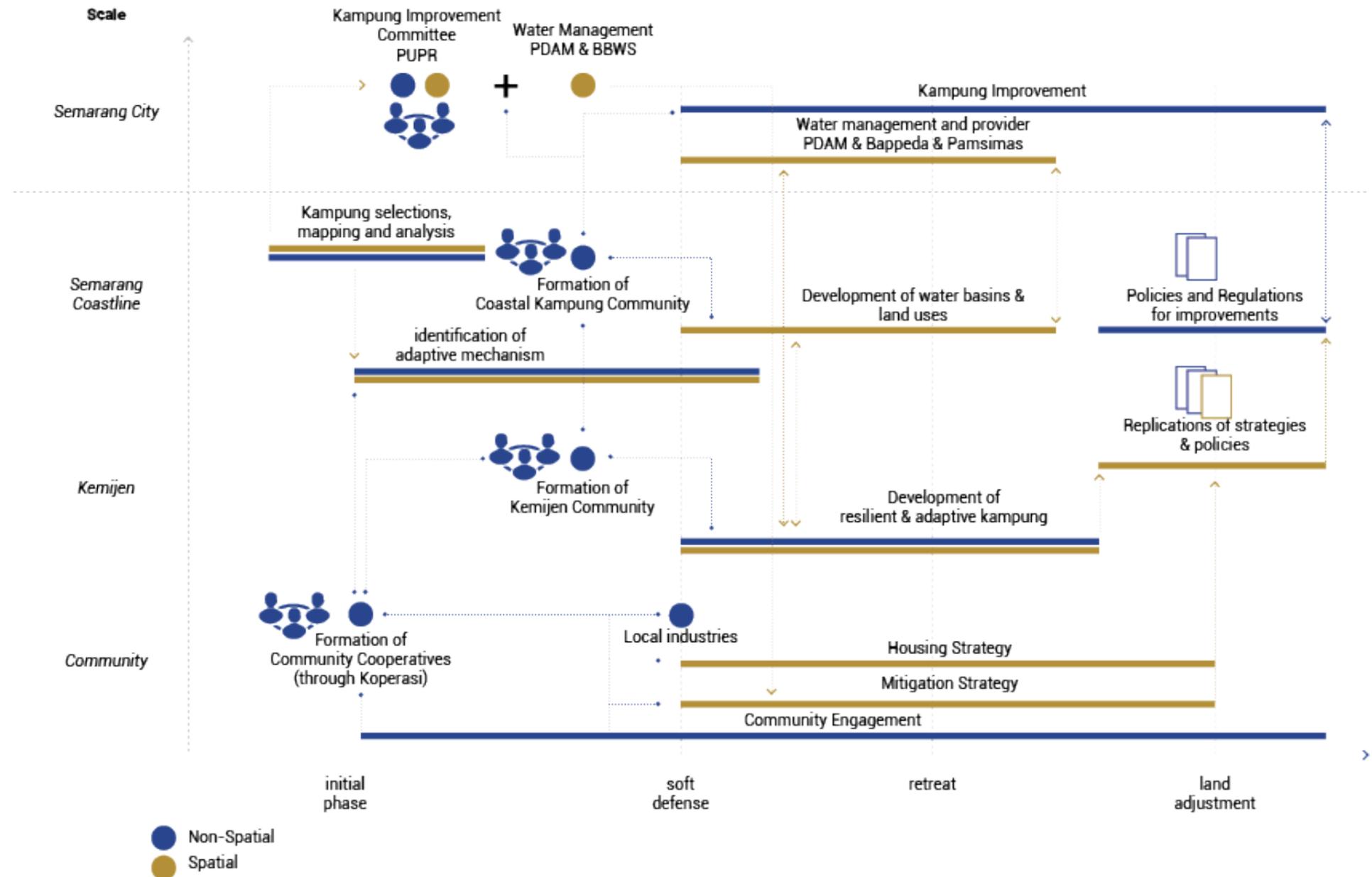
This proposal tries to shift the normative planning in which the top to bottom approach is implemented. This proposal tries to ensure the public participation and giving them role as the supervisors and executors in the urban planning process.



MUNICIPALITY

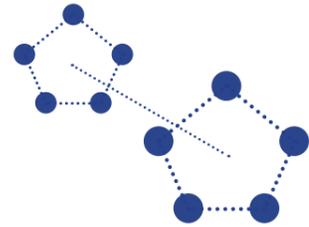


COLLABORATION WITH PRIVATE SECTORS



# Where?

## Integrated Strategies

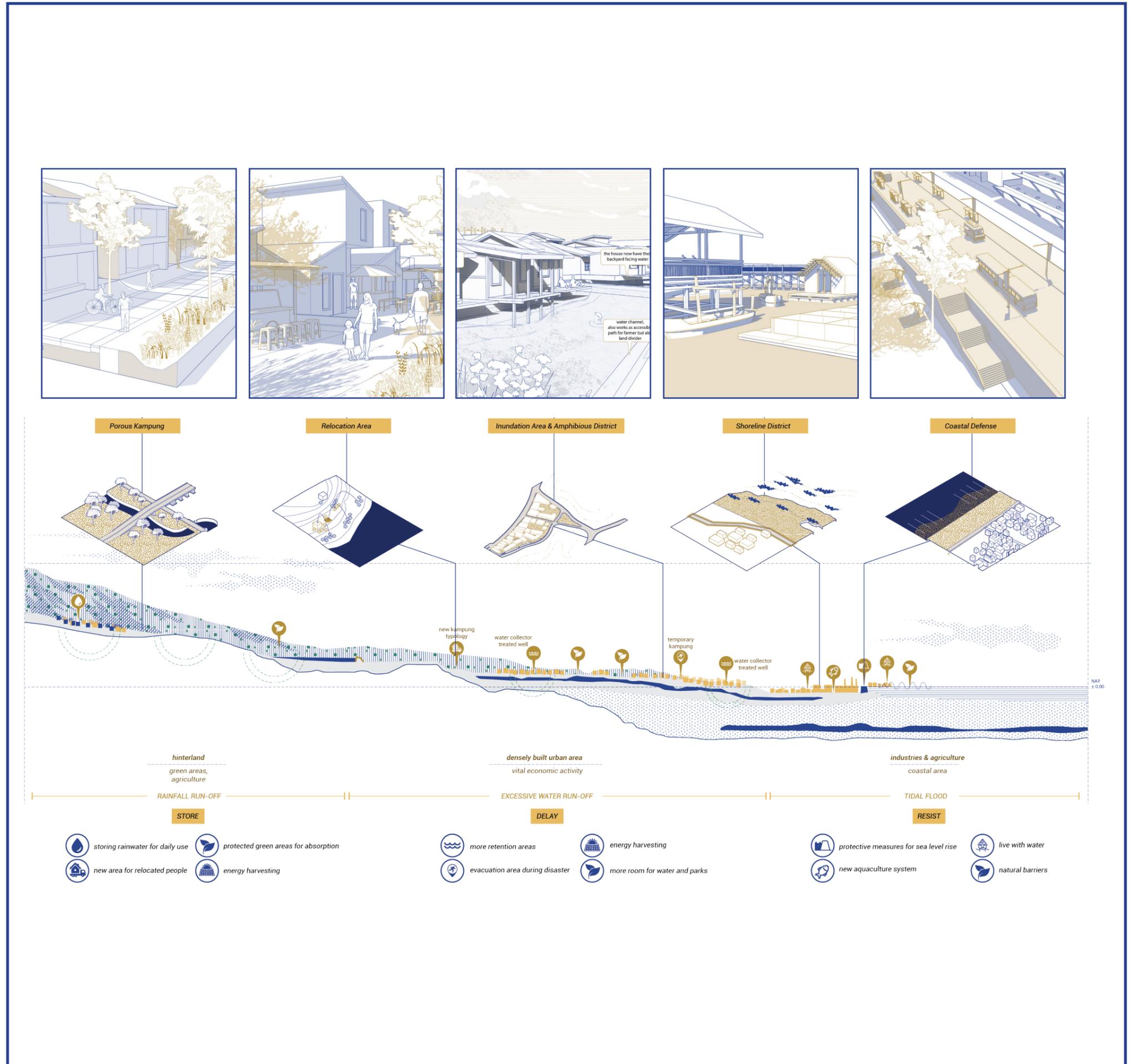


This proposal aims to implement intervention to improve urban condition on the district scales based on the common grounds as it is more effective and replicable to similar context and stakeholder variations.

To develop this, several areas of common grounds with possible intervention are identified to improve the existing condition which are aligned with the larger scale strategies.

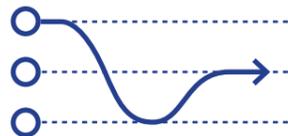
These strategies on the district scale are composed by five different strategies (inundation area & coastal defense; porous kampung & amphibious district; relocation area), developed based on the scenarios (soft defense-re-treat!-land adjustment) according to land use planning and stakeholders involvement.

In this proposal, kampung Kemijen will be an inundated areas. Strategies are proposed in this kampung to ensure the quality of the kampung is improved and livable for the people in this kampung which will be explained further later on in this proposal.



# When?

## Three Scenarios



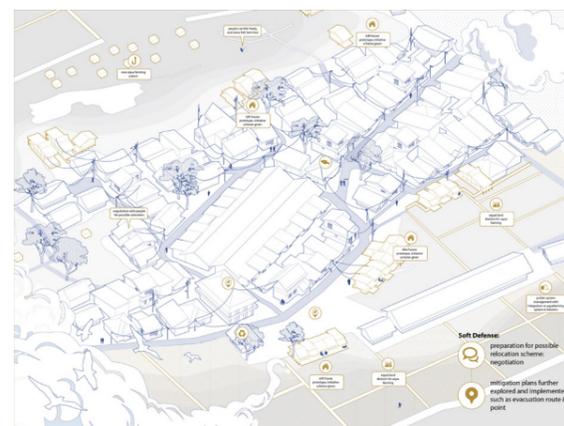
Much of this recent interest in urban design repeats the familiar mistakes: it only focuses on the final product and aesthetic aspect of the cities instead of the roles of the community development processes. These processes can be developed through times, but different implementation of stages needs to be specified.

These can be done by developing strategies which can be implemented on each time phase while also provides space for flexible implementation of overlapping strategies between time phases. The result of this time phasing is to create a Work in Progress stage, allowing flexible project implementations.

In Kemijen, the strategies are divided in three phases: Soft Defense, Retreat! and Land Adjustment. In each time phase, provided set of possible strategies which can be implemented in Kemijen. The strategies, however, can overlap and be applied to other time phase (see page 27).

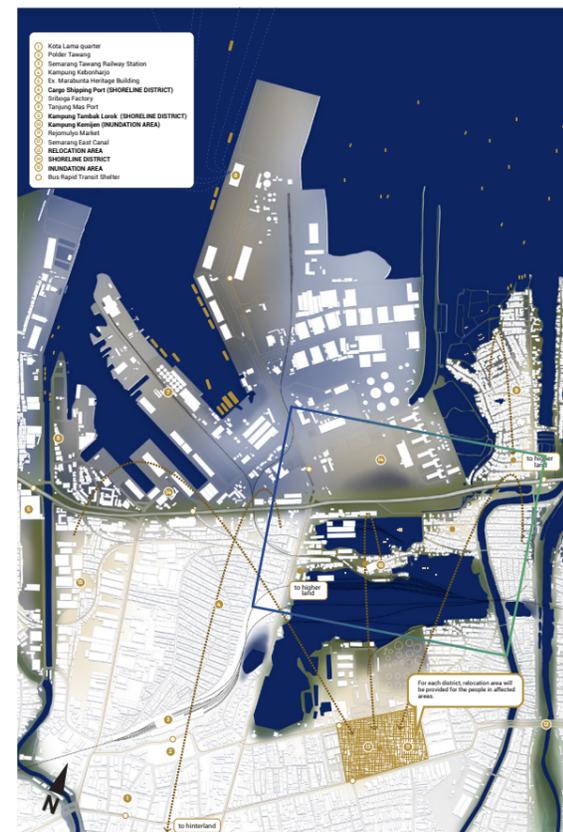
## Strategies - Time Phase planning

### Soft Defense



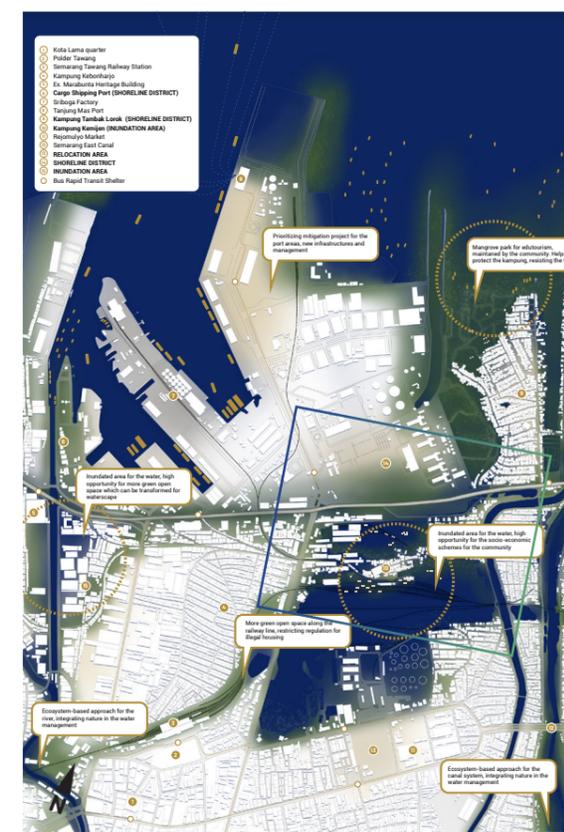
**Soft Defense:**  
preparation for possible relocation scheme negotiation  
mitigation plans further explored and implemented such as evacuation route & point

### Retreat!

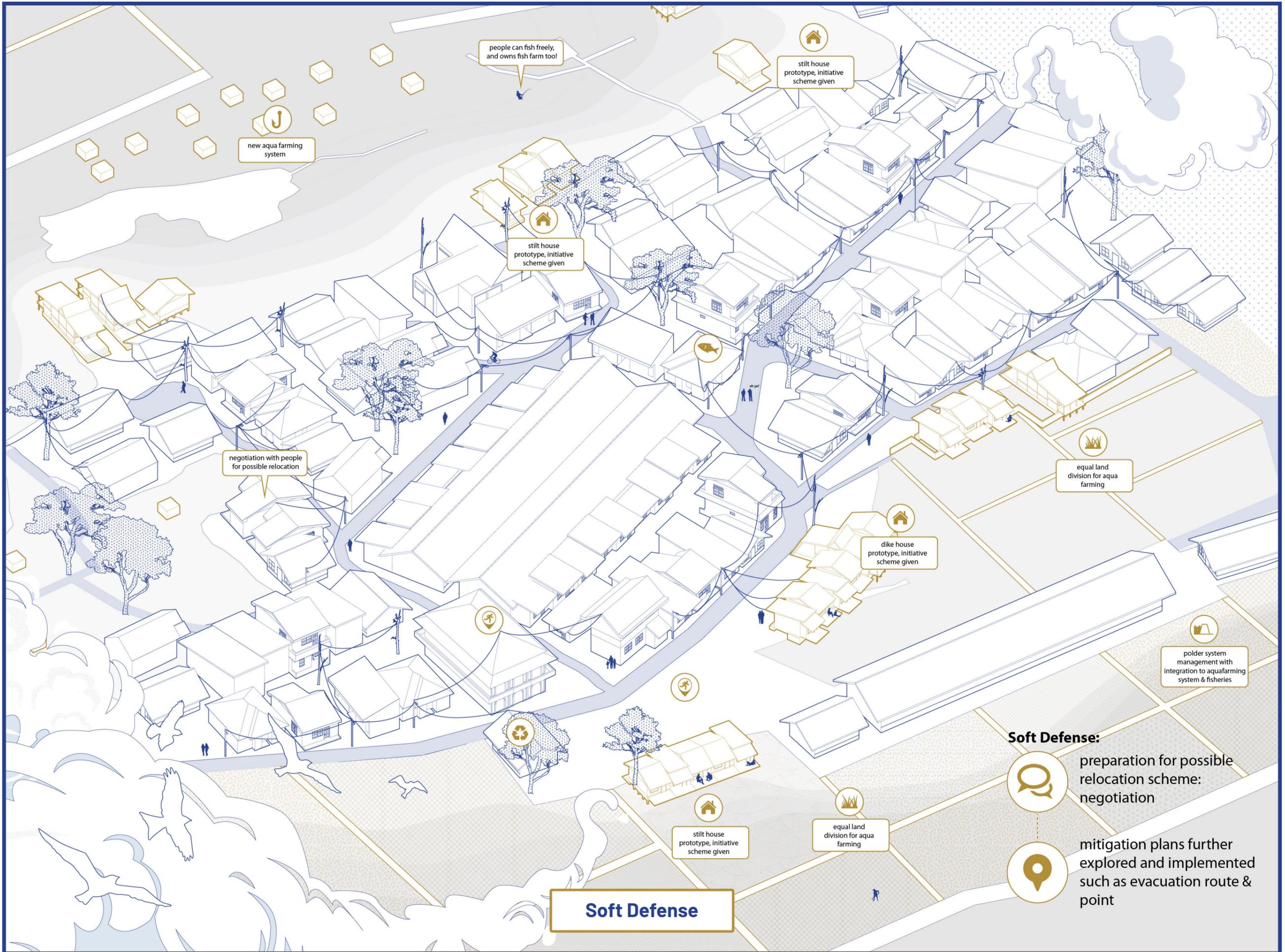


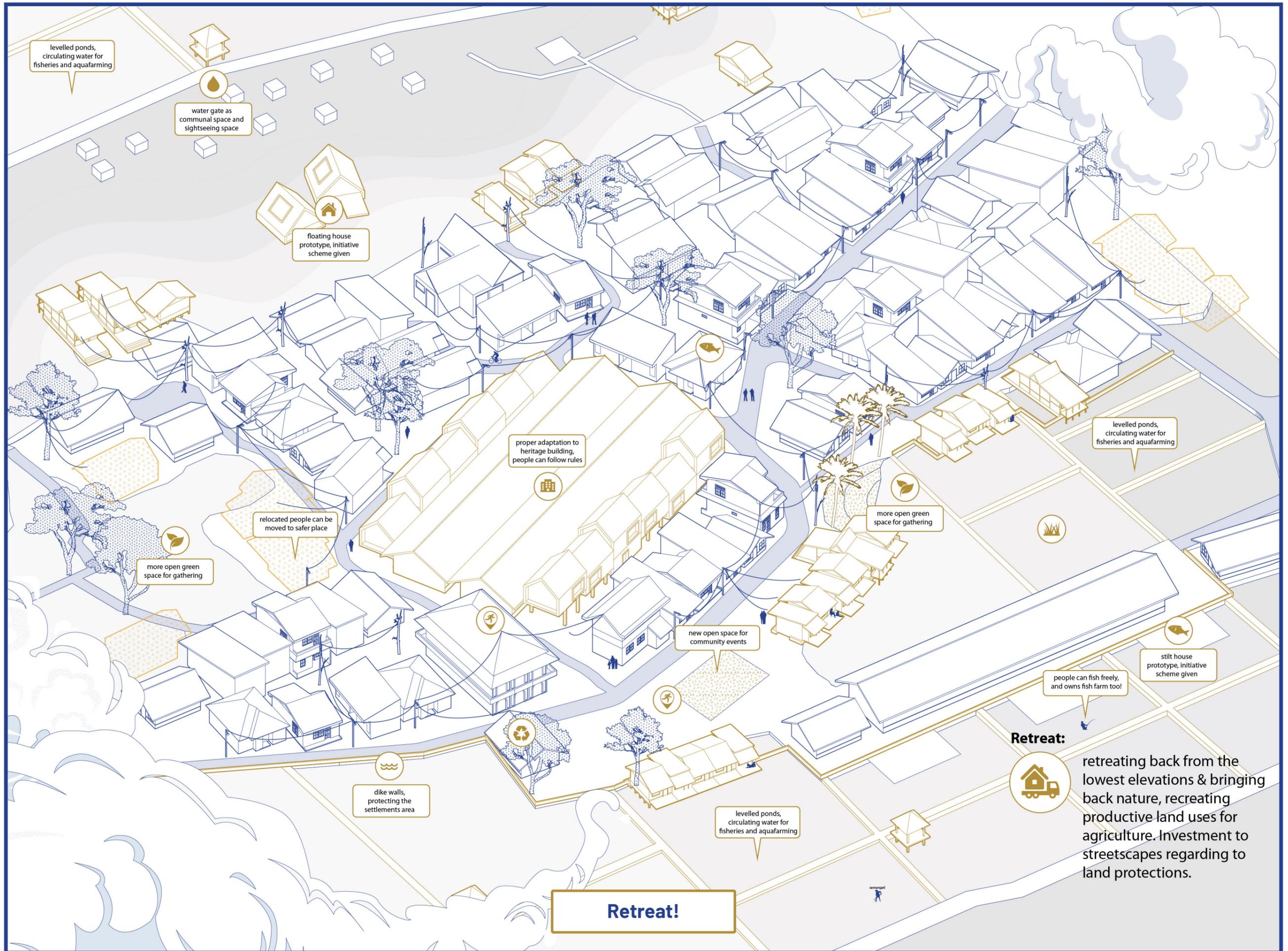
**Retreat:**  
retreating back from the lowest elevation & bringing back nature, requiring productive land uses for agriculture, investment to immigrants regarding to land protection.

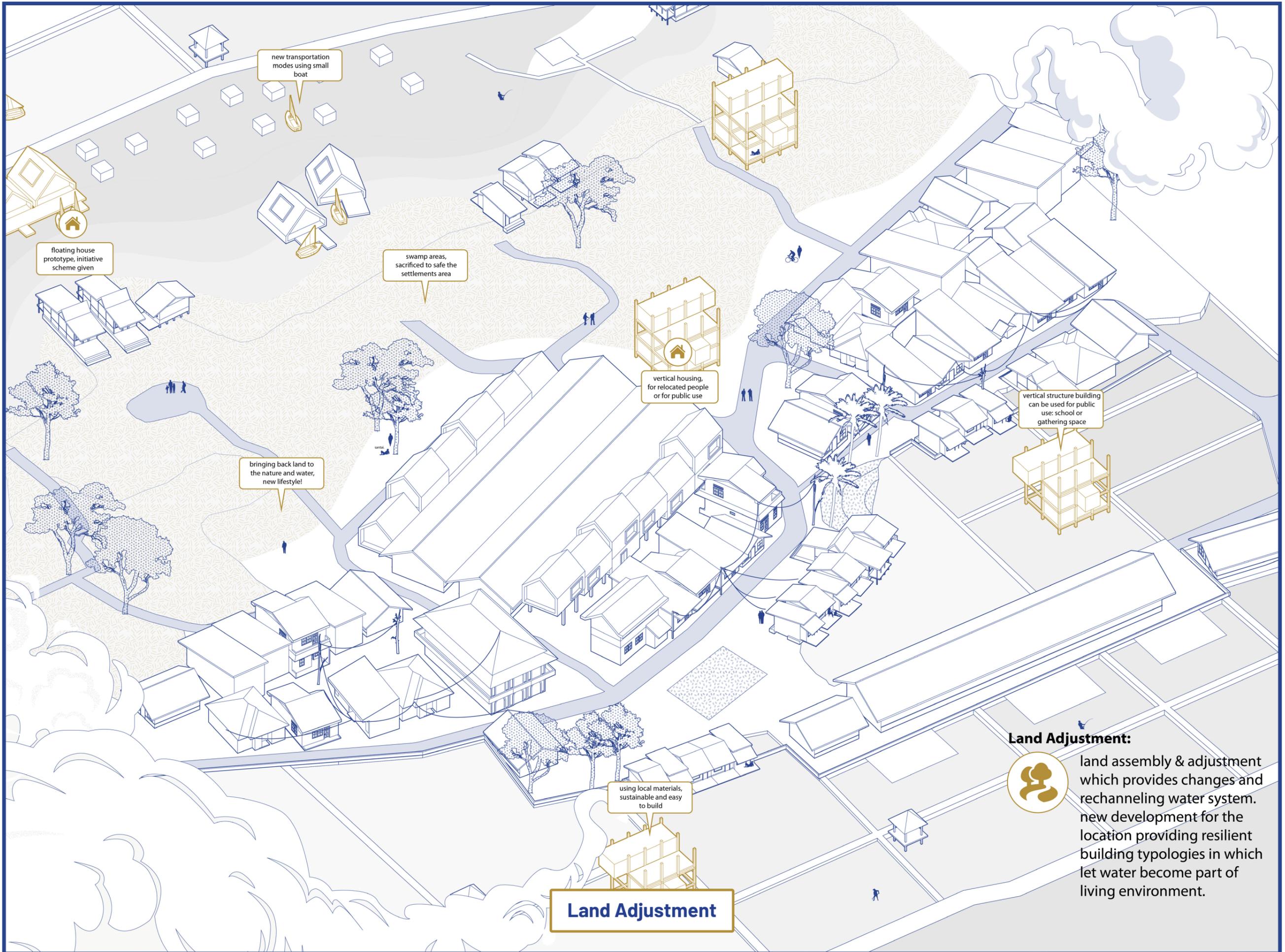
### Land Adjustment



**Land Adjustment:**  
land assembly & adjustment which provides change and recharging water system, new developing resilient building typologies in which let water become part of living environment.







### Land Adjustment

#### Land Adjustment:



land assembly & adjustment which provides changes and rechanneling water system. new development for the location providing resilient building typologies in which let water become part of living environment.

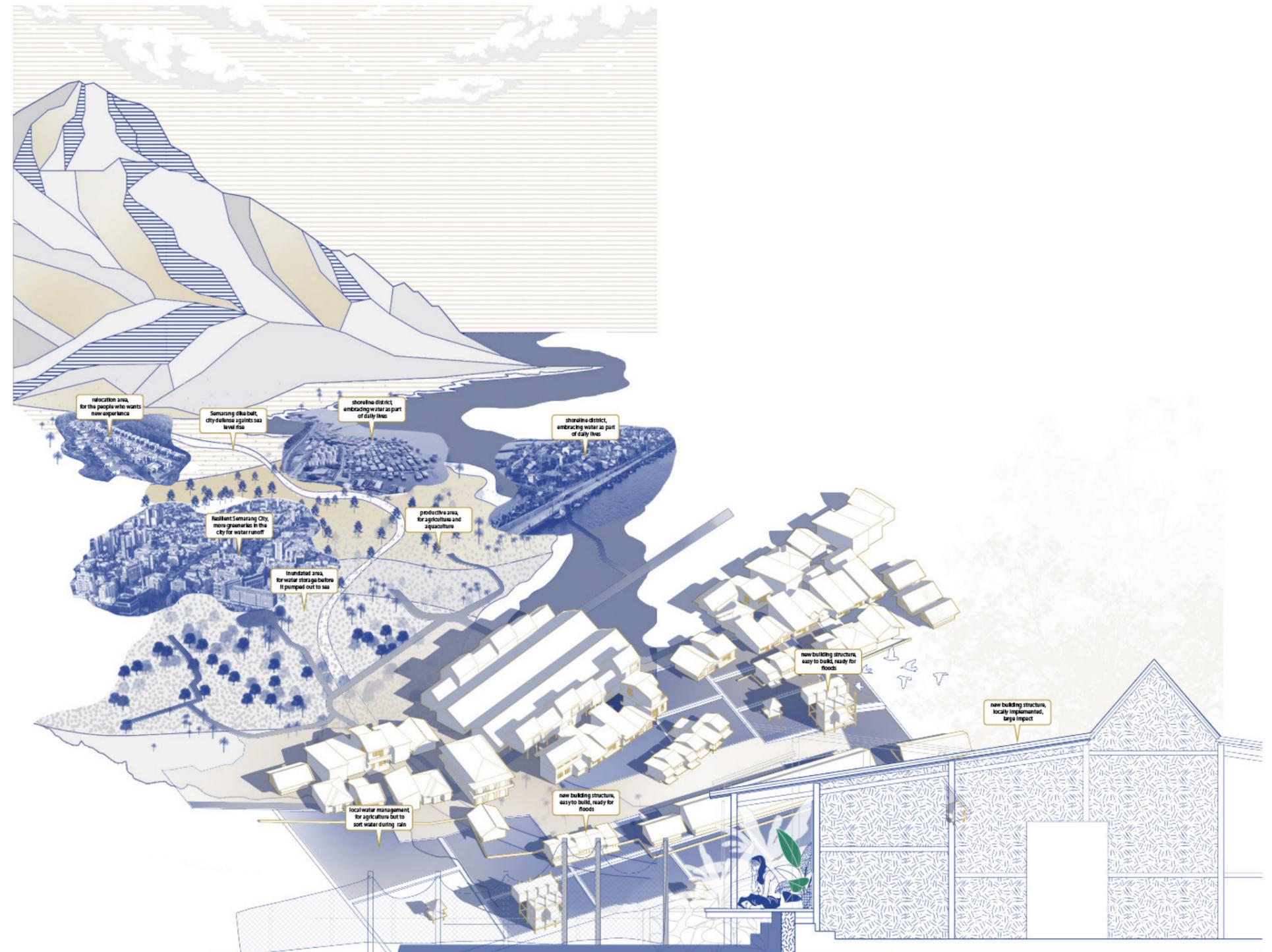
## Why?

# Towards Resilient City

This Strategic Framework can be described as a tool to understand the complexities of Semarang region; the flood and land subsidence issue, overexploitation of groundwater extraction, local relationship to the sea and the threatened coastal ecosystem. Without research, analysis and site observation, it will be difficult to understand the conflict and limitation of the context and the relationships of the built environment and the ecological system.

The goal of the Strategic Framework is to develop a general understanding and possibilities of balancing the soft and hard approach in urban mitigation planning from the human scale through to city scale.

The projects tries to read the relationships between three scale of planning: city of Semarang, the coastal area (on district scale), the kampung and most importantly to the human scale. The project at some point are very site, time and contextual specific. Therefore the participation of the people and the high concern of climate and ecological based planning are very important.



# How?

## Catalog of Strategies

### How to Use It?

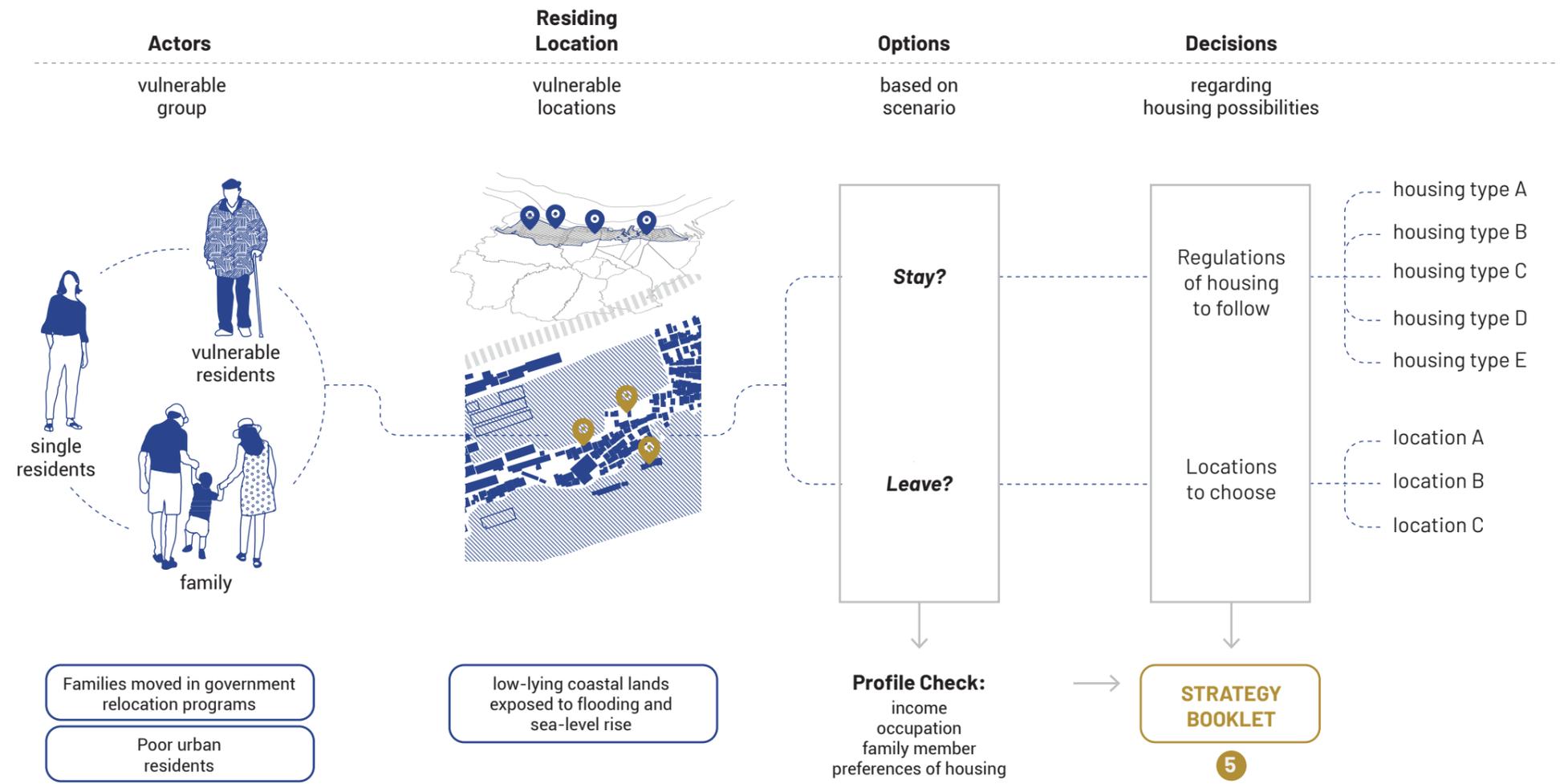
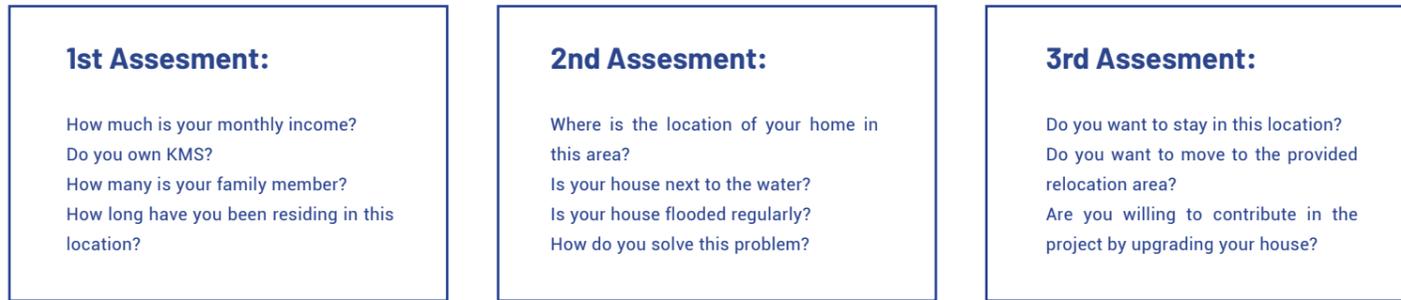
This Catalog of Strategies are provided for anyone to propose kampung improvement (especially housing upgrade) in their kampung. Before it is presented to the community, the analysis of the site is already done through analysis and research but also site observation. It is important to notice that since the beginning, the community is already involved in the making of possible strategies and then is translated to the strategic framework. The first task to communicate the strategies is through activities and session which includes workshops & discussion with the related stakeholders (experts, communities, municipality and private stakeholders) and assigning the roles. When it is done, the project can be started.

### For the community:

The first step to implement this catalog is to understand your role and status in your kampung structure. It is aimed for those who are willing to contribute to the kampung improvement and is willing to create change in their environment.

The first task is to check if you have Kartu Menuju Sehat or Health Card Insurance (KMS) to make sure you will get incentives in upgrading your house. The second task is to look at the general maps of the proposed strategies where your house is located. Your house location is very important, because you might have the strategic location to have a dike house. The third task is to communicate with your kampung leader or RW leader, that you are willing to contribute to this scheme by upgrading your house. Along with the kampung leader, the established community who are responsible to conduct the project together with your family will help you to upgrade your house with necessary technical assistance.

As for the people who are willing to move out from the kampung, we provide you an information of the relocation scheme which can ensure you better environment with affordable funding scheme for you and your family.



- Families moved in government relocation programs
- Poor urban residents
- Those in areas that will be occupied by large infrastructure projects
- Those dependent on industries in low lying areas
- New arrivals/urban poor migrants
- Female-headed families

low-lying coastal lands exposed to flooding and sea-level rise

**What to do next:**

You need to communicate your decision to your kampung leader, they will assign you with the person in charge and help you with the housing construction. You can follow the instruction and take a look at the technical drawing to ensure your upgraded houses meet the health standards provided by the municipality.

# How?

## Catalog of Strategies

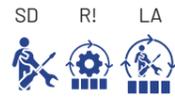


### How to Use It?

After you did your assesment, the next step is to decide what strategies you want to use. All the sets are provided in this documents along with the technical construction and the stakeholders/building experts/community which might help you in constructing your house building.

By choosing this framework, you have contributed to your community and improve the environment towards health-ier and resilient kampung.

### Step by Step:



1. See the general kam-pung strategy through scenarios



2. See where your house is located



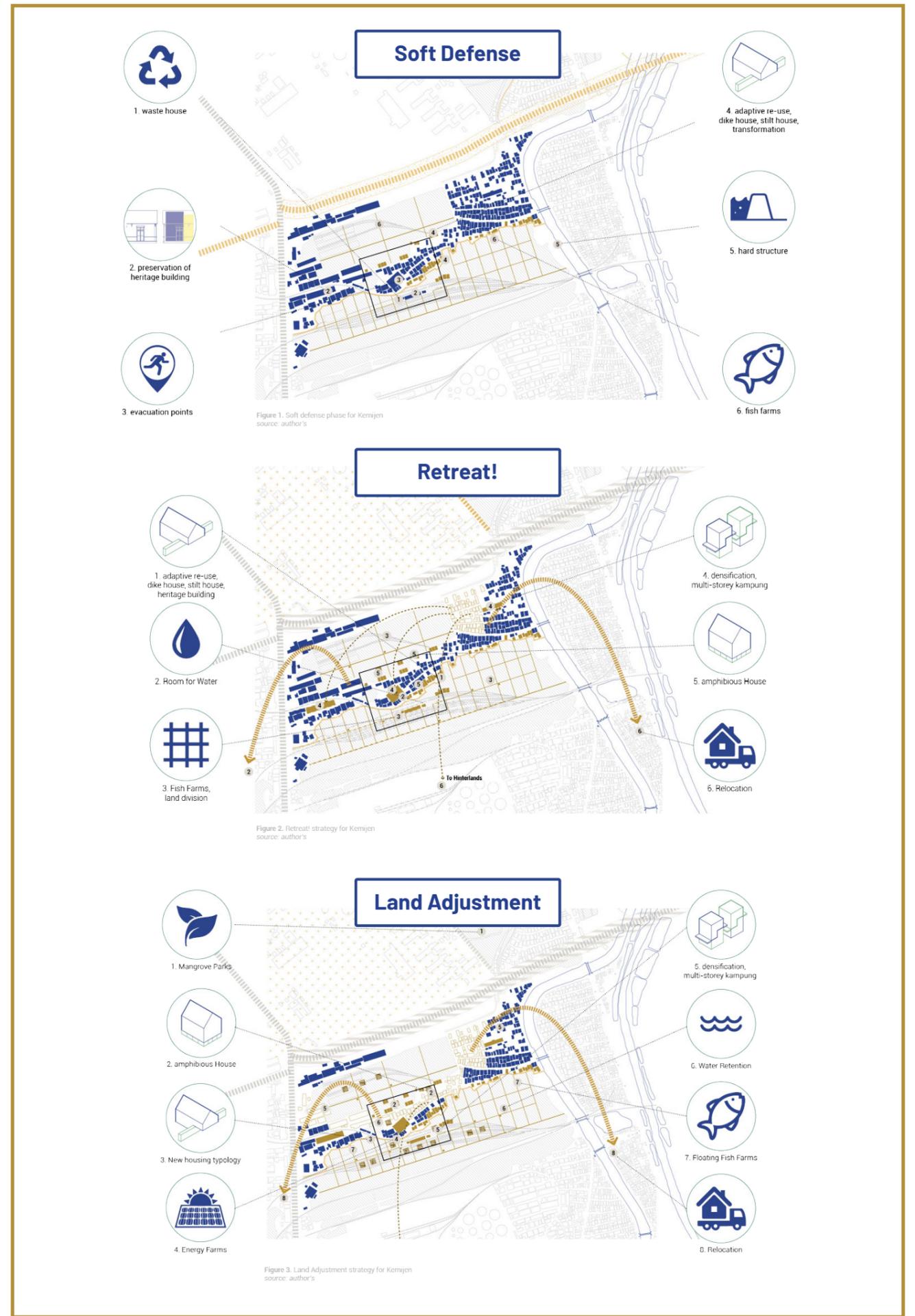
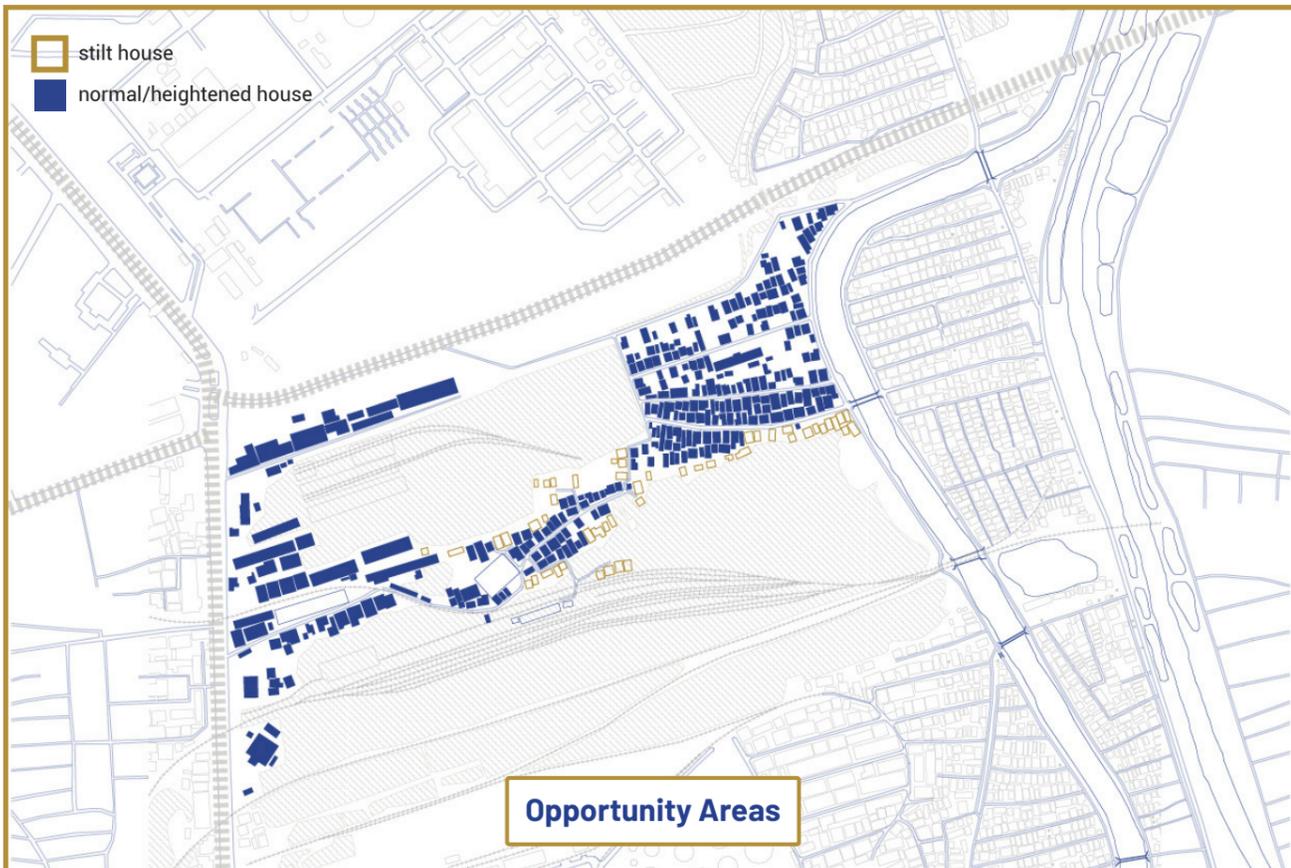
3. See what are the strat-egies



4. See the set of provided housing upgrade strat-egies



5. Communicate with your kampung leader for your final decisions regarding funding schemes and con-struction phase



00 — Preparation —

01 — Soft Defense —

02 — Retreat! —

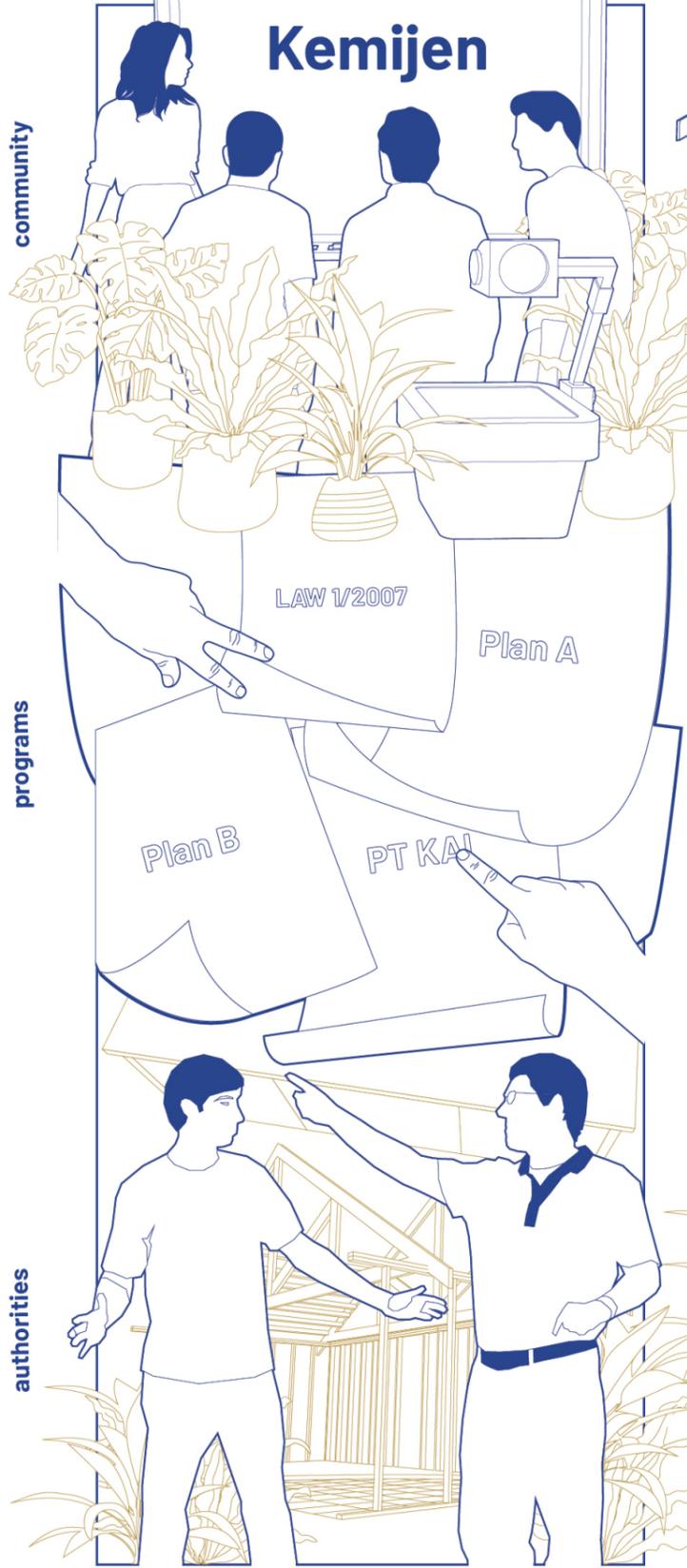
03 — Land Adjustment —

community

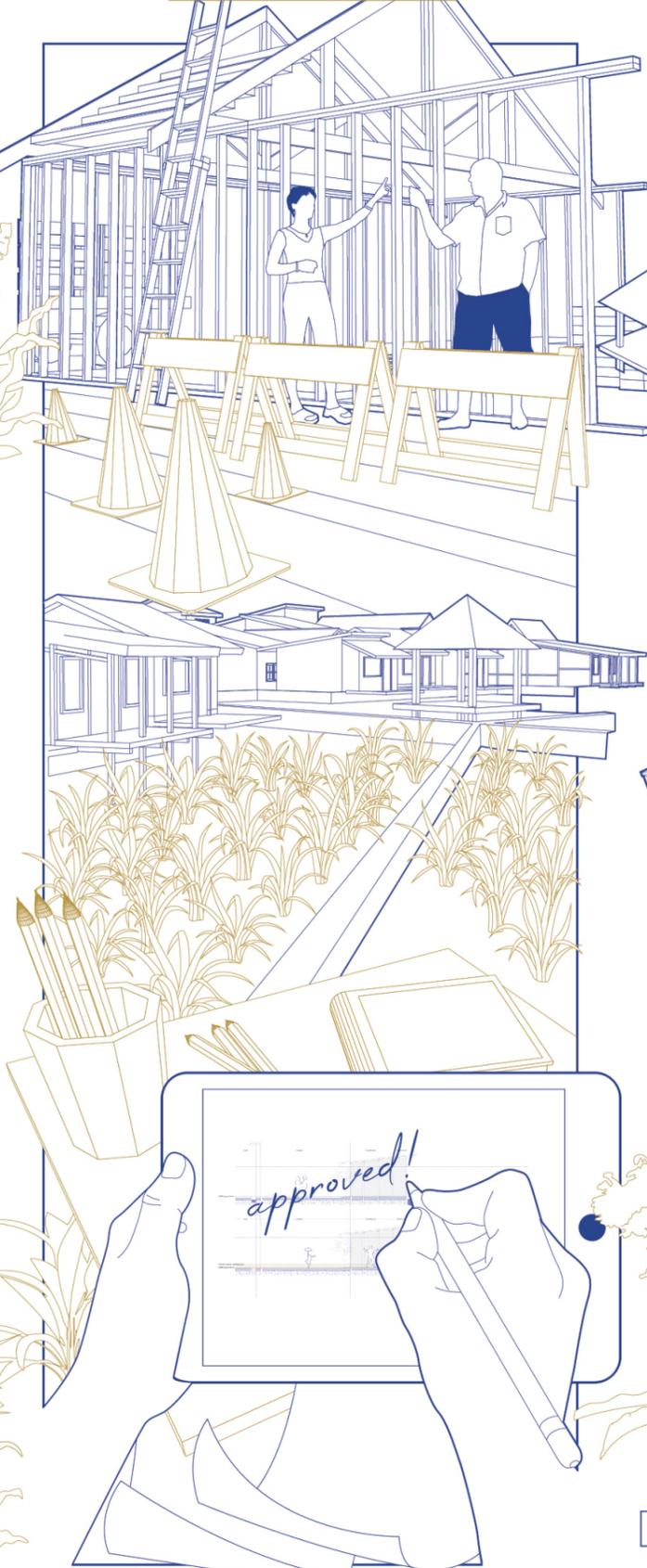
programs

authorities

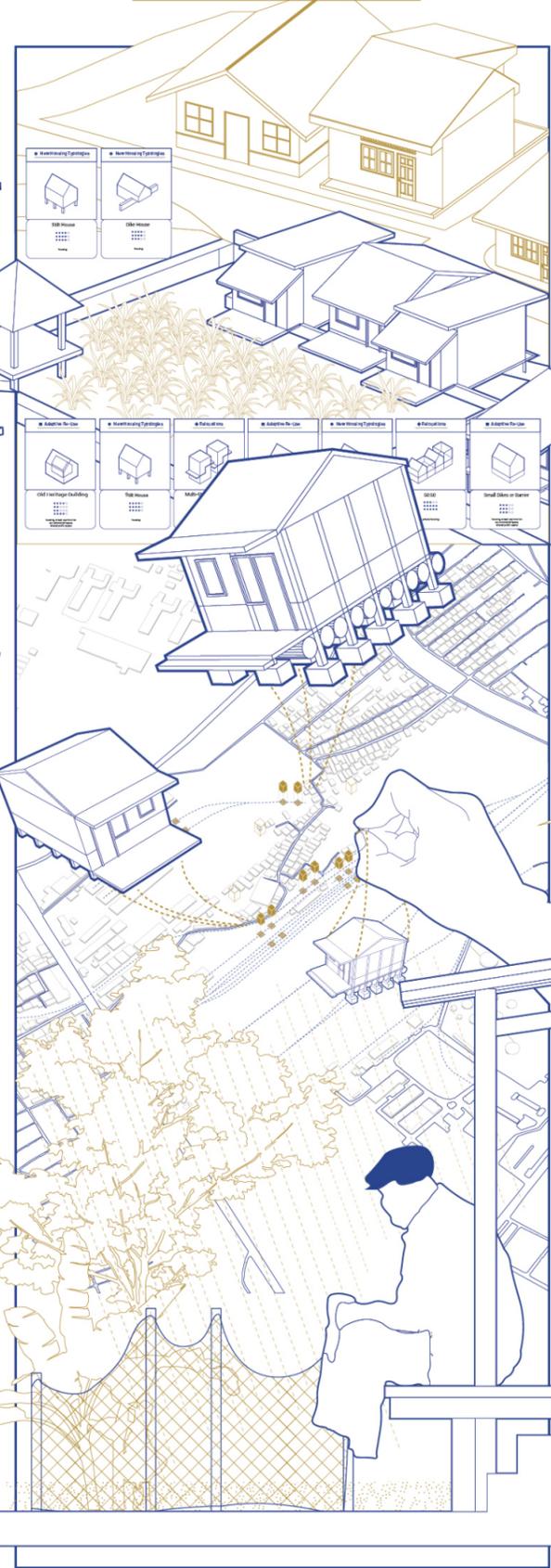
# Kemijen



consolidate



effectuate



evaluate



replicate

# .01 Adaptive Re-Use

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In this section, will be explained the adaptive re-use strategies which can be implemented by using the existing building structure

Single Unit  
**H01 / Dike House.**

Description Code / H01

The dike house allows you to have your own backyard facing your own fishpond and fishfarm. On this scheme, we urge you to transform your house installed with dikes which connects to your neighbors. You can have your own backyard or connected with your neighbors.

Incentive Schemes

Cost: 5 million - 7 million  
 Funding Scheme:

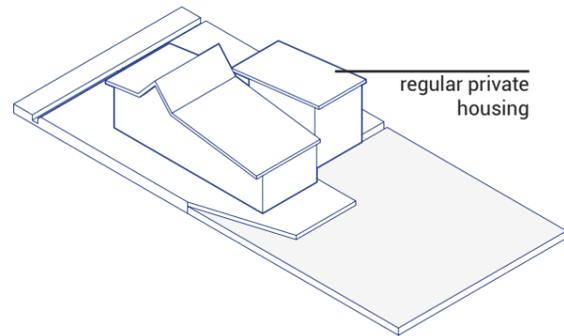
INCENTIVES



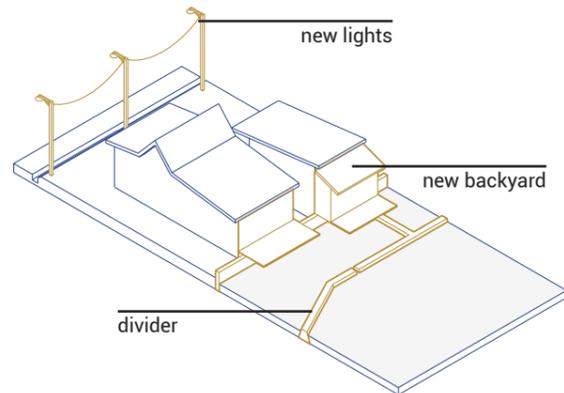
- credits (SSB)
- advance payment (SBUM)

These banks include PT Bank Tabungan Negara (Persero) Tbk (BTN), PT Bank Negara Indonesia (Persero), Tbk (BNI), and PT Bank Rakyat Indonesia (Persero) Tbk (BRI). Each person gets a payment reduction in the form of interest rate (SSB) of 5 percent per year during the 10-year subsidy period, as for the advance payment (SBUM) of landed houses to be 1 percent.

Current Spatial Condition



regular private housing

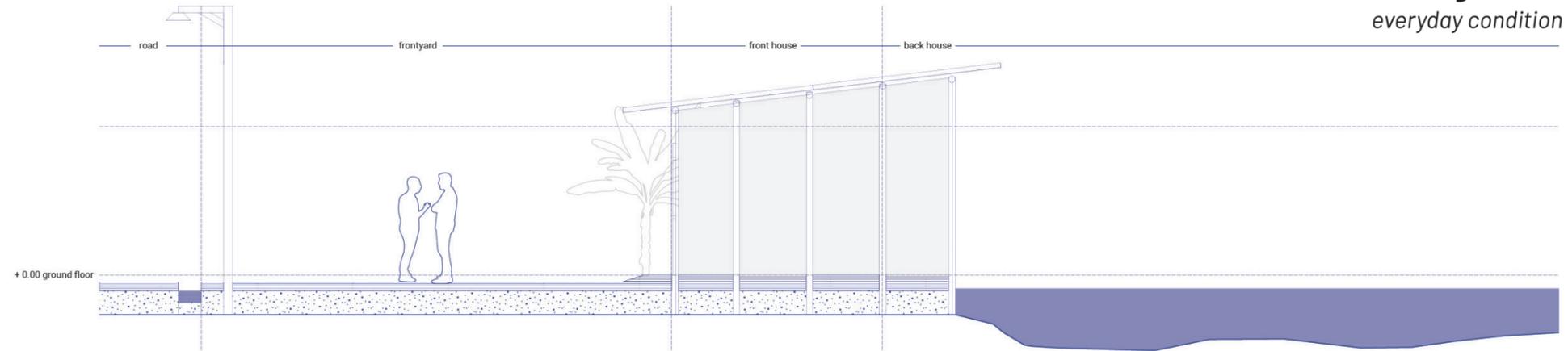


new lights

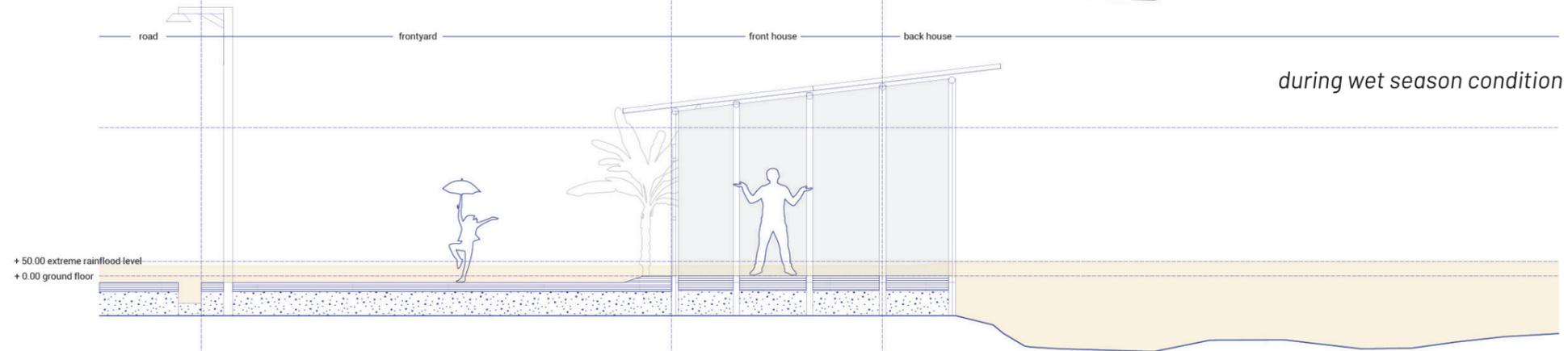
new backyard

divider

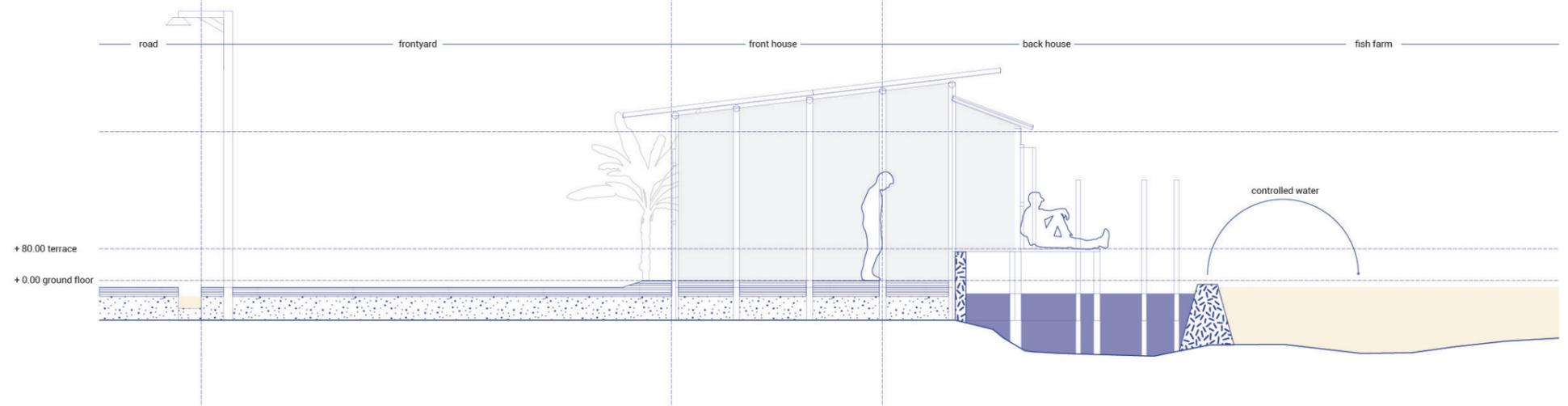
**existing house**  
 everyday condition



during wet season condition



**proposed house**  
 during wet season condition

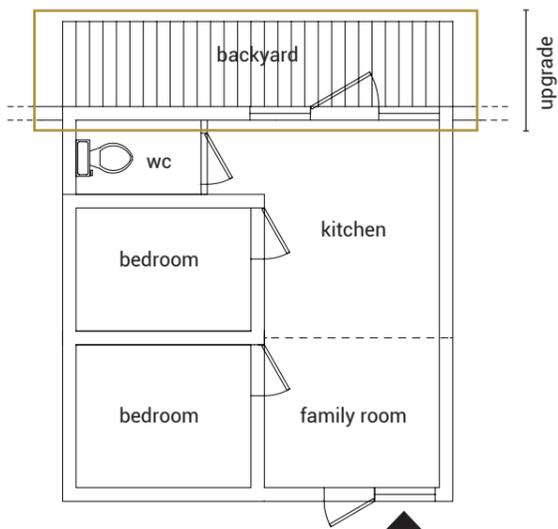


Single Unit  
**H01 / Dike House.**

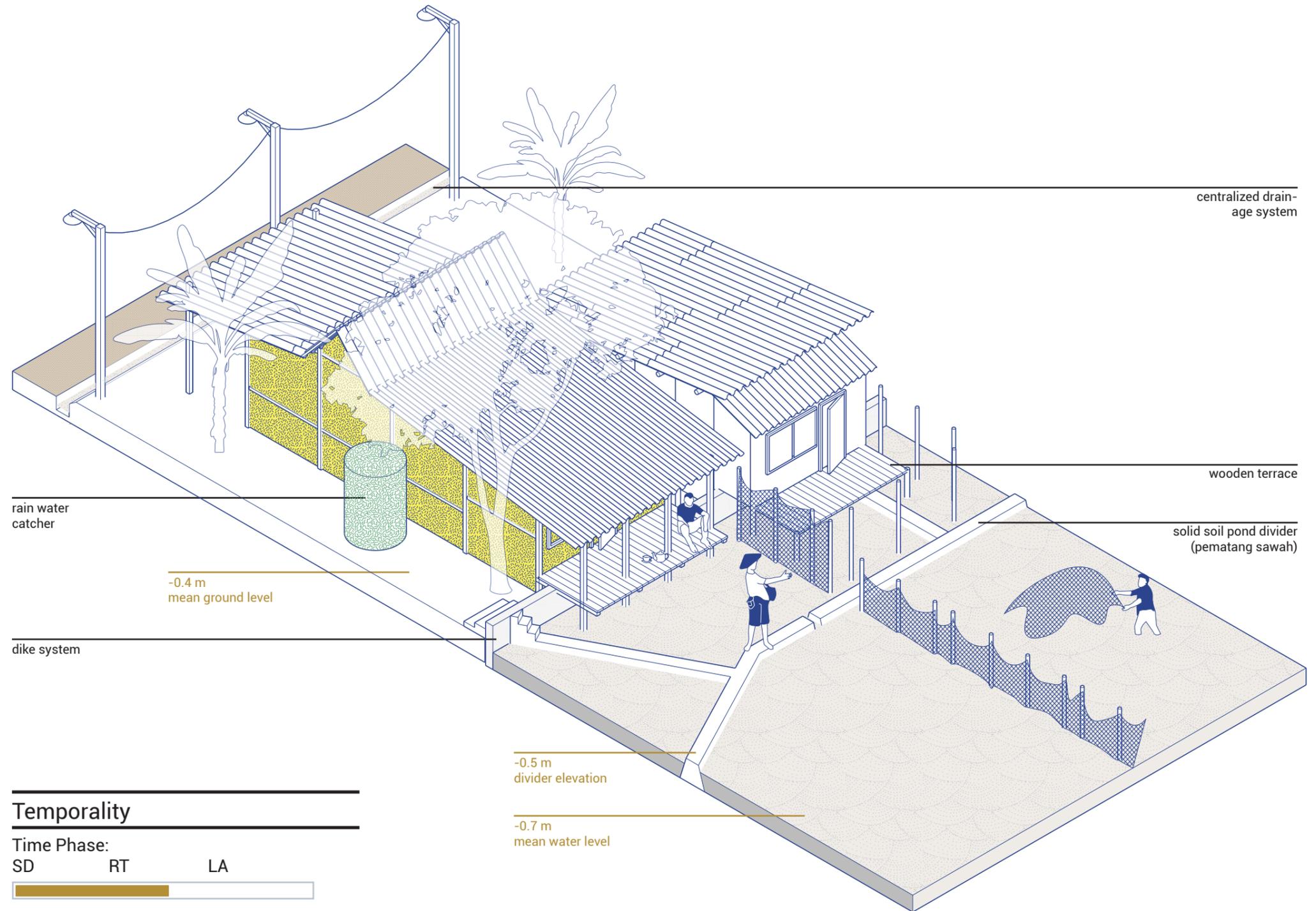
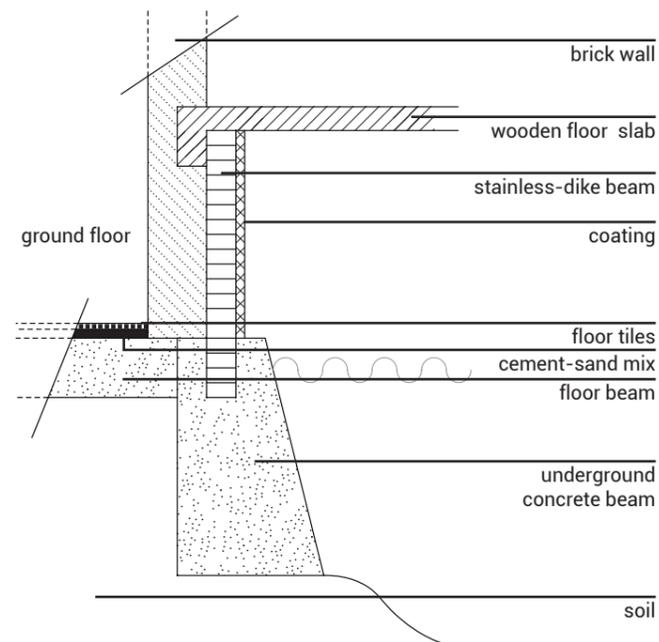
Site

If your house is located on the yellow color on the map, then we urged you to upgrade your house into this scheme or relocate yourself.

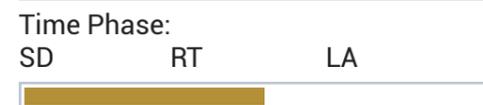
Program / Floorplan



Infrastructure



Temporality



With this housing scheme, after --- years you will have to consider moving out from the location to avoid worse flooding and land subsidence occurrence. We highly suggest you to start investing your money if you want to move out.

Single Unit  
**H02 / Stilt House.**

Description Code / H02

The stilt house will save you from seasonal flood. With new construction system for house unit, you can have a semi-floating house. We urged you to upgrade your house into a semi-floating house if you are still willing to stay on site location, to prepare you for the flooding.

Incentive Schemes

Cost: 10 - 15 million  
Funding Scheme:

INCENTIVES



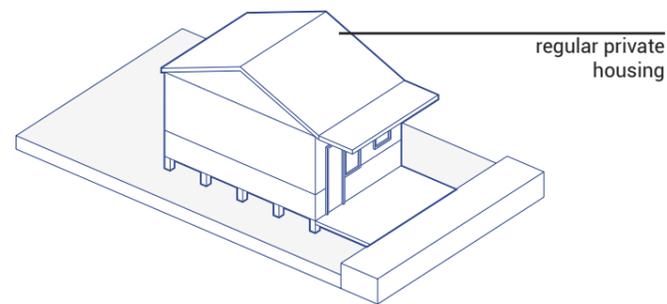
financials

credits (SSB)

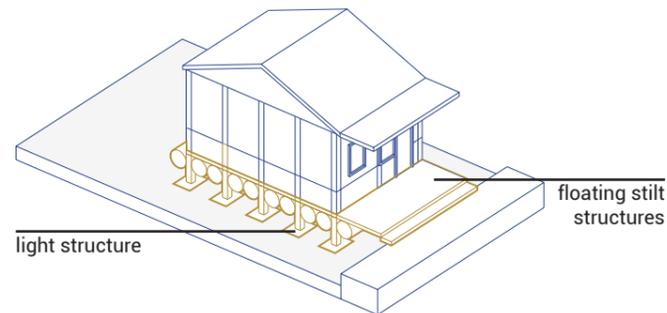
advance payment (SBUM)

These banks include PT Bank Tabungan Negara (Persero) Tbk (BTN), PT Bank Negara Indonesia (Persero), Tbk (BNI), and PT Bank Rakyat Indonesia (Persero) Tbk (BRI). Each person gets a payment reduction in the form of interest rate (SSB) of 5 percent per year during the 10-year subsidy period, as for the advance payment (SBUM) of landed houses to be 1 percent.

Current Spatial Condition



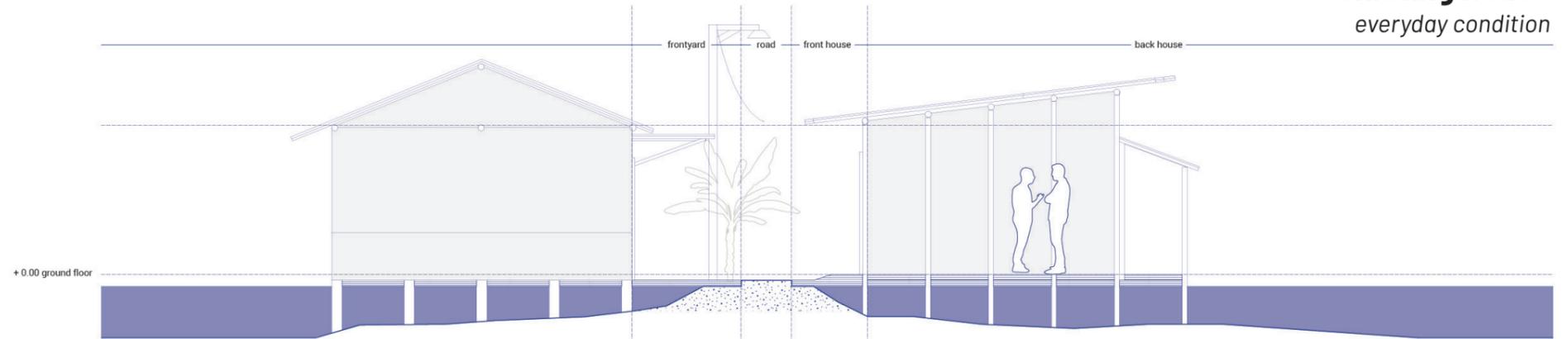
regular private housing



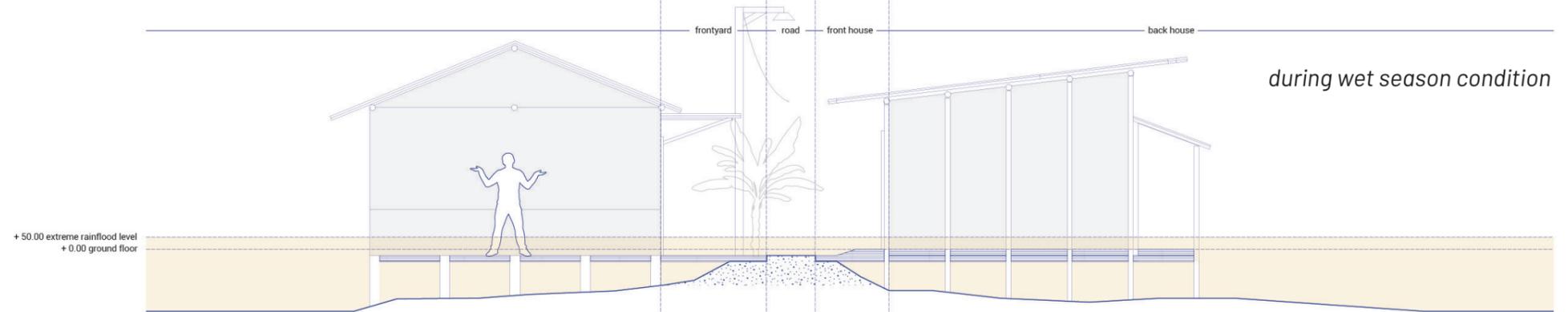
light structure

floating stilt structures

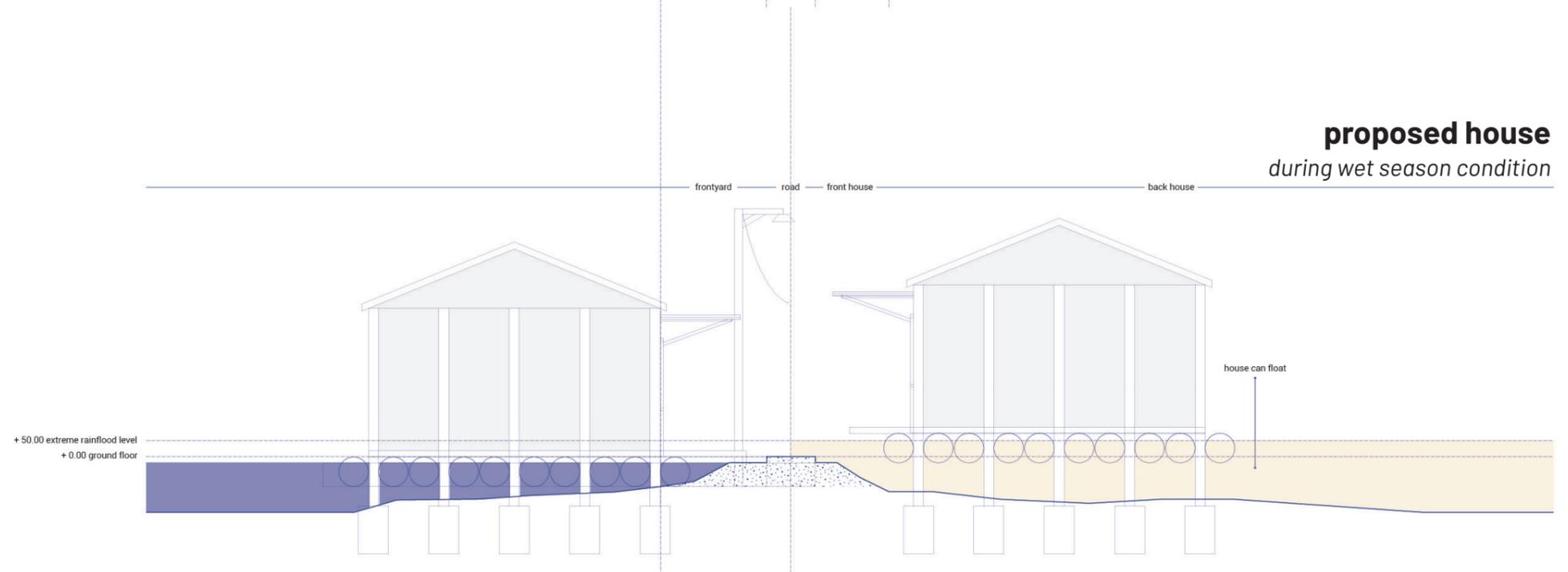
**existing house**  
everyday condition



during wet season condition



**proposed house**  
during wet season condition

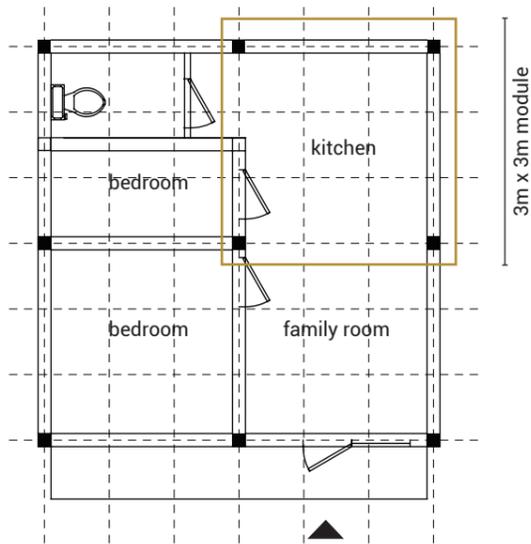


Single Unit  
**H02 / Stilt House.**

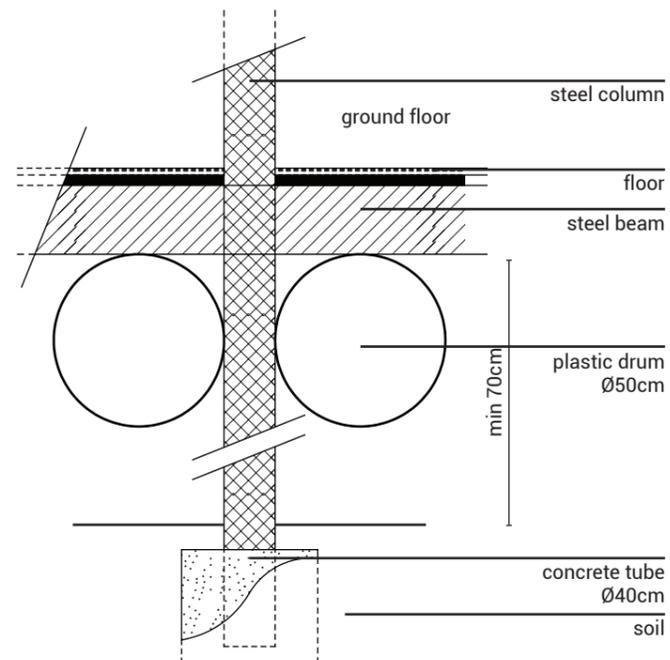
Site

If your house is located on the yellow color on the map, then we urged you to upgrade your house into this scheme or relocate yourself.

Program / Floorplan



Infrastructure



Temporality



With this housing scheme, after --- years you will have to consider moving out from the location to avoid worse flooding and land subsidence occurrence. We highly suggest you to start investing your money if you want to move out.

light aluminium roof truss

light gypsum

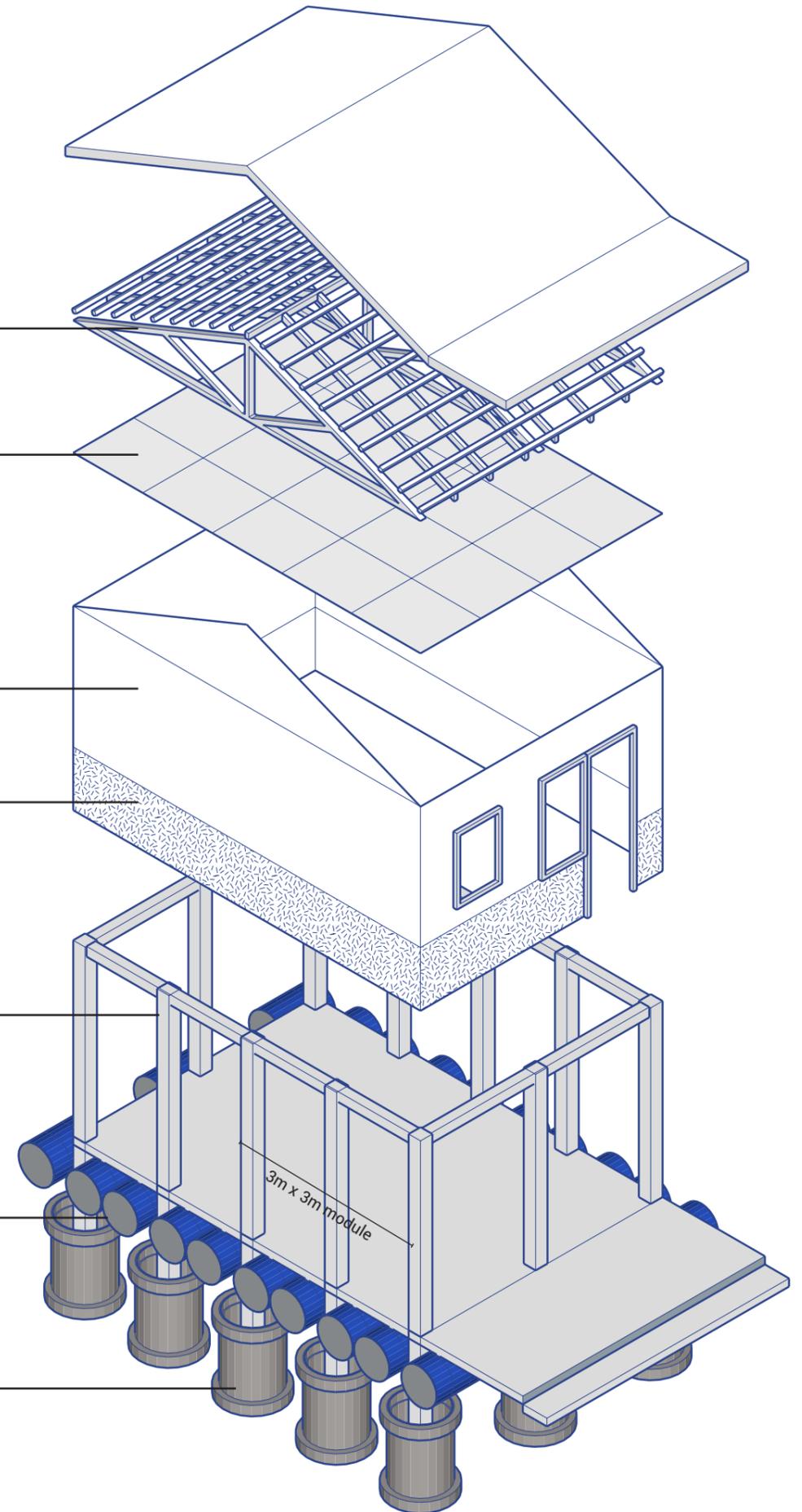
building unit

using very light materials, such as transparent fiber

main column using CNP steel, works as building column as well

plastic drum Ø50cm, lifting house structure, adjusting to water level

foundation using concrete tube Ø40cm



Single Unit/Compound  
**H03 / Adaptive House**

Description Code / H04

For the settler of heritage building, we offer new scheme for the housing if you prefer staying, however new regulations to keep the building intact is highly required. The settlers can stay but to change their lot size according to the building structure and follow the recommended house type. The settler can also join in the tourism scheme to attract people and also raise awareness in preserving heritage building.

**Incentive Schemes**

**Funding Scheme:**

**INCENTIVES**



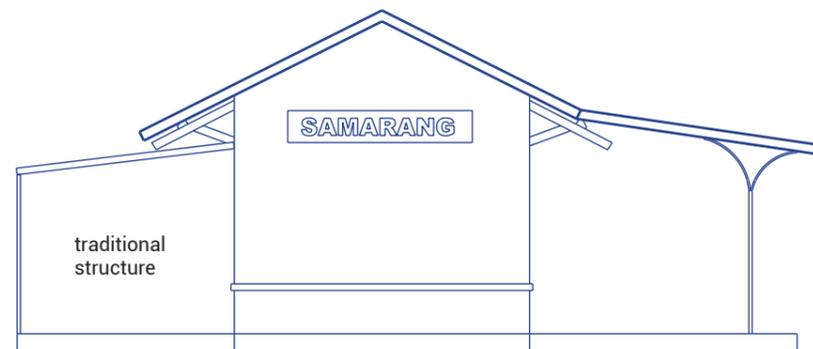
These banks include PT Bank Tabungan Negara (Persero) Tbk (BTN), PT Bank Negara Indonesia (Persero), Tbk (BNI), and PT Bank Rakyat Indonesia (Persero) Tbk (BRI). Each person gets a payment reduction in the form of interest rate (SSB) of 5 percent per year during the 10-year subsidy period, as for the advance payment (SBUM) of landed houses to be 1 percent.

**Stakeholders:**

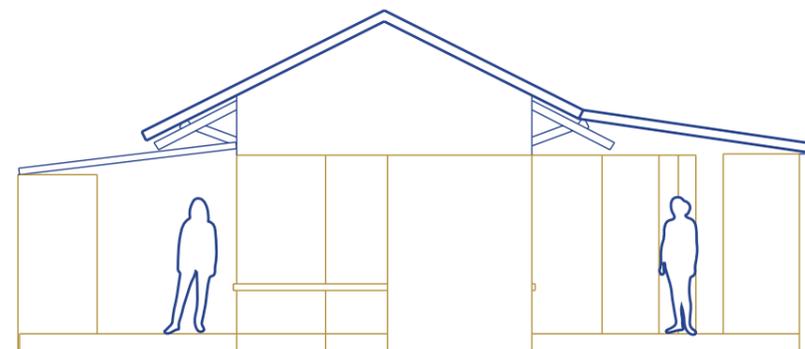
- KAI
- BP2KL
- Indonesian Railway Preservation Society (IRPS)

**Building Transformation**

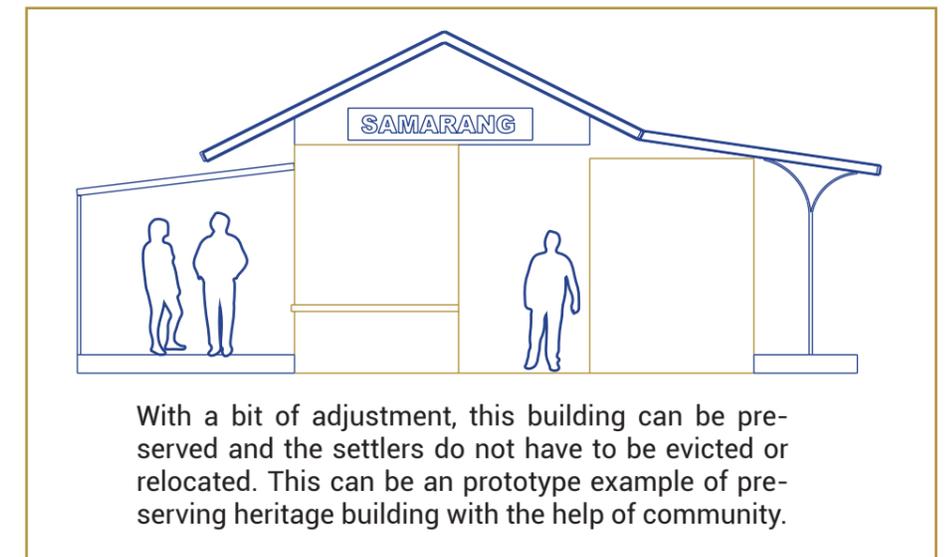
The existing buildings will be adjusted to the building structure, therefore some of the unit has to be merged and cut to fit the lot size. With better facilities, this can ensure healthier environment for the settlers.



The original building of Samarang Station consists of three part, with main function as passenger station located in Kemijen.



The existing station is now cannot be seen, however the structure of the building is still there and is maintained rather well by the settlers.



With a bit of adjustment, this building can be preserved and the settlers do not have to be evicted or relocated. This can be an prototype example of preserving heritage building with the help of community.



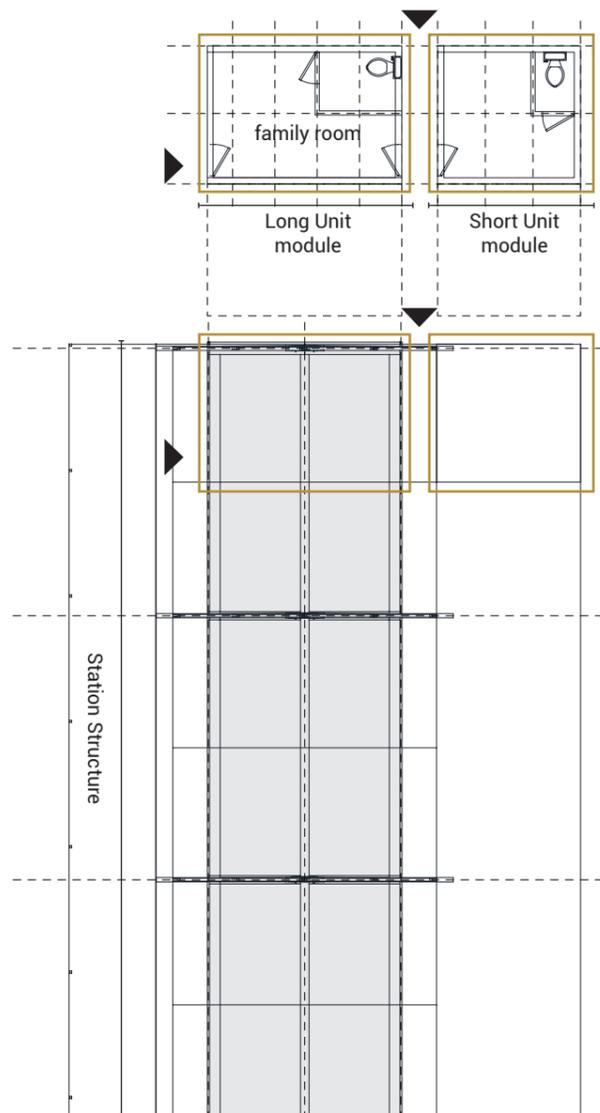
Single Unit/Compound

# H03 / Adaptive House

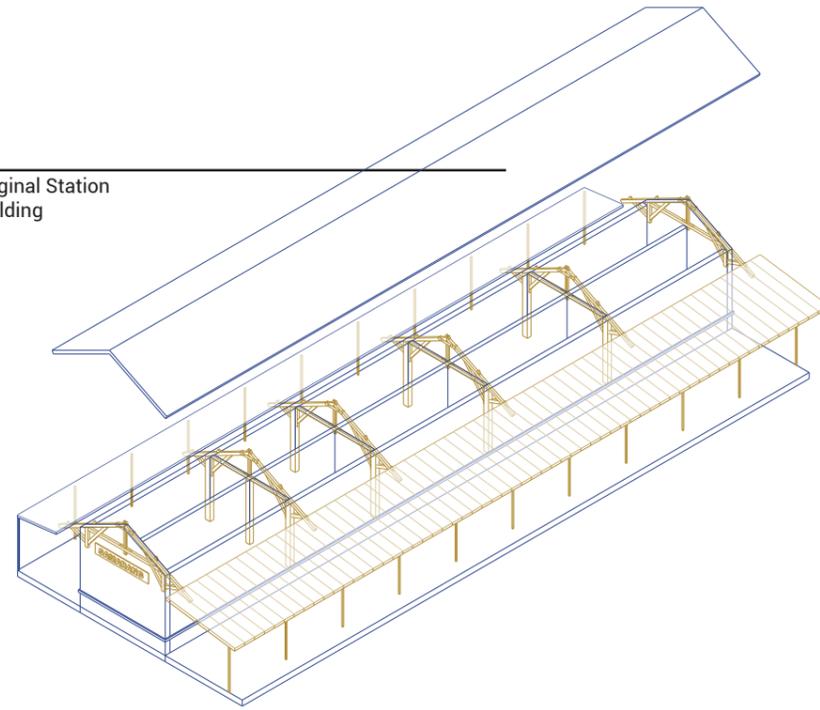
## Function Details

For each unit, all will have new sanitary room (toilets and bathing units). All the drainage will be connected to the central drainage of the village. Each unit will get monthly subsidies for building maintenance. Each owner of the unit will have to join monthly workshop of heritage building, these informations will then be given to visitors.

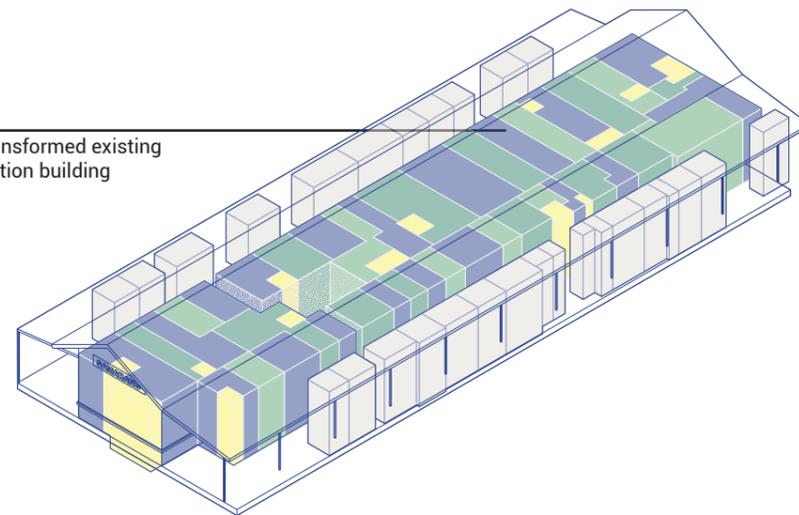
## Program/Floorplan



Original Station building



Transformed existing station building

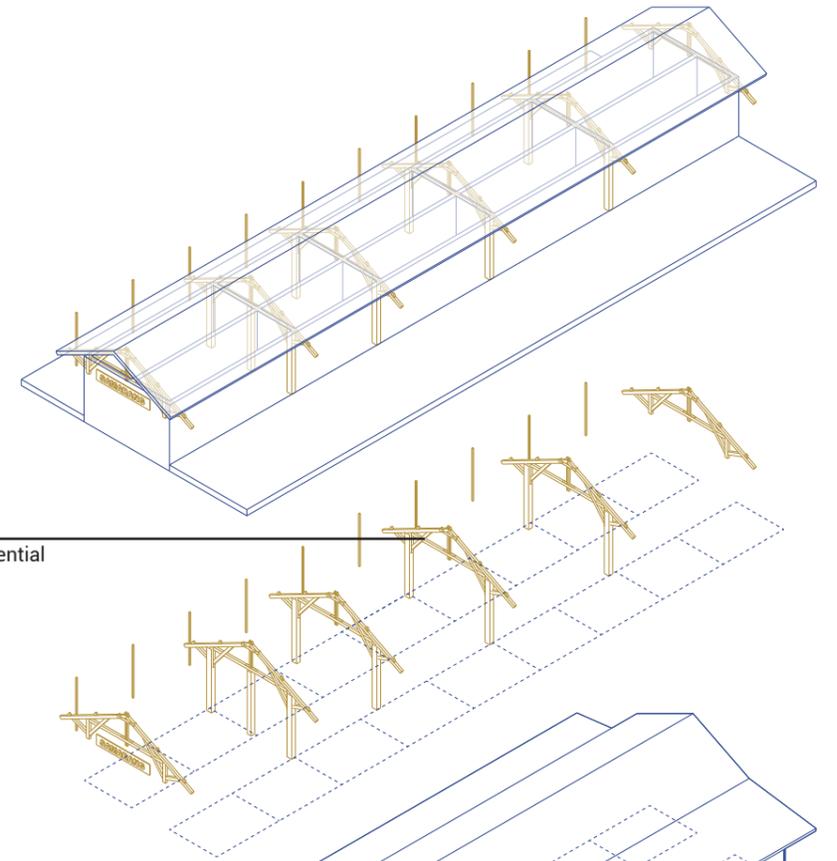


## Temporality

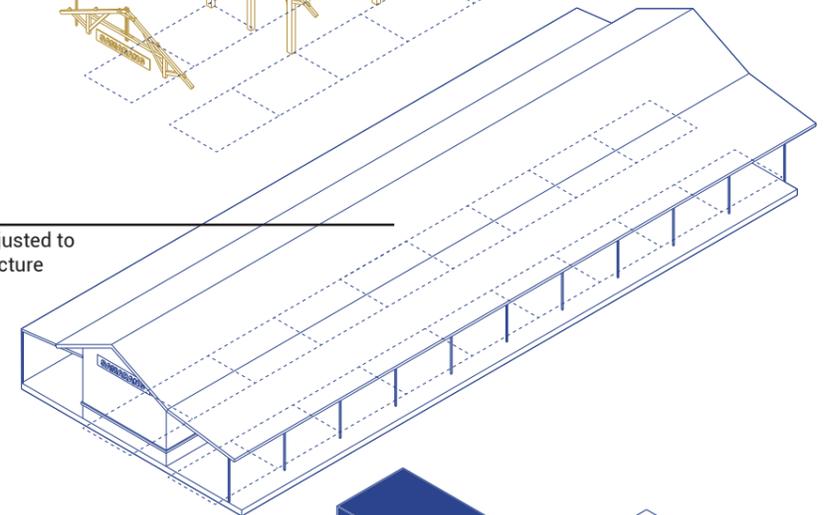


This scheme mostly located on high level of sinking area, where it will keep sinking for the next 10-20 years. Regular flooding will still occur during these times, but this scheme can help preserving important building with similar issues.

Original essential structure

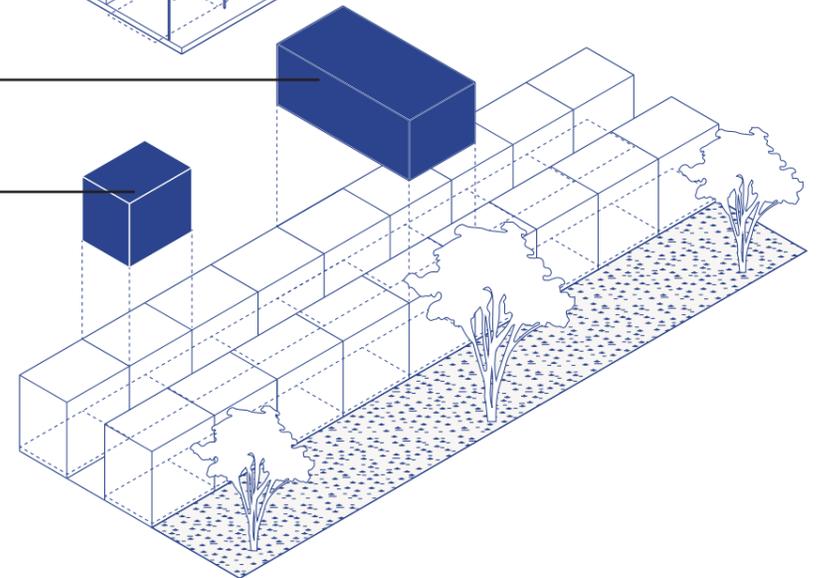


New unit adjusted to original structure



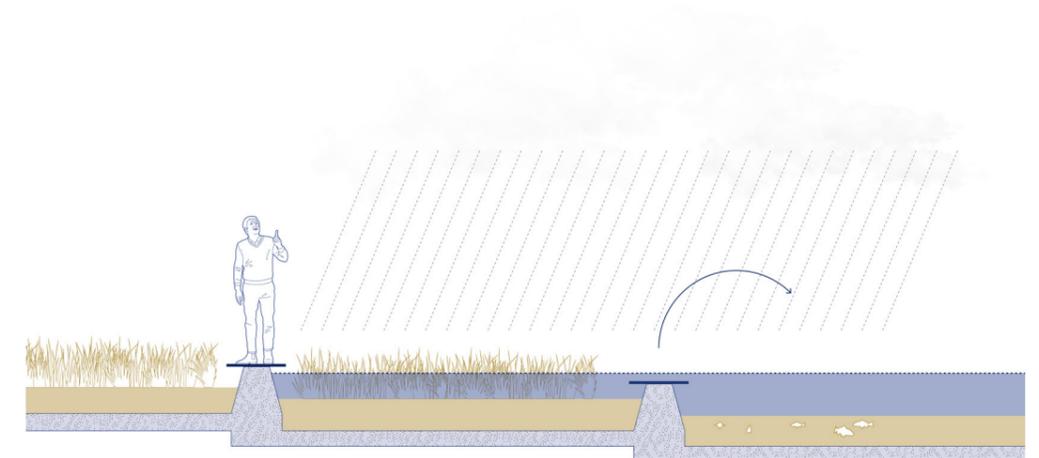
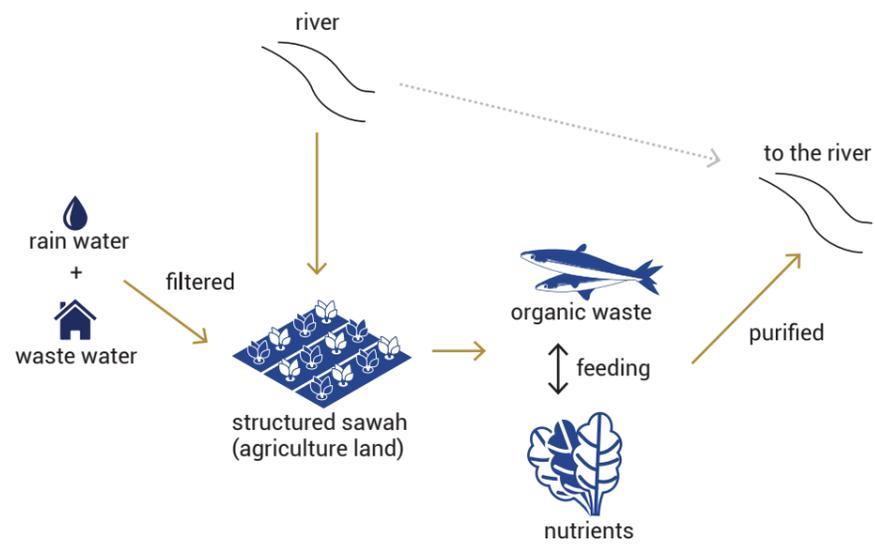
Long Unit

Short Unit



# Conceptual Visualisation

Modular Unit:  
 H01: Dike house  
 H05: Vertical house



# .02 New Housing Typology

---

In this section, will be explained the adaptive re-use strategies which can be implemented by using the existing building structure

Single Unit  
**H04 /Floating House.**

Description Code / H03

The floating house will save you from seasonal flood. The structure is easy to built and cost you less than rebuilding your house. We suggest you build this house if you want to try out new experience. This house comes with your DIY floating farm. We provide you two different style, traditional and modern.

Incentive Schemes

Cost: 15 - 20 million  
 Funding Scheme:

INCENTIVES

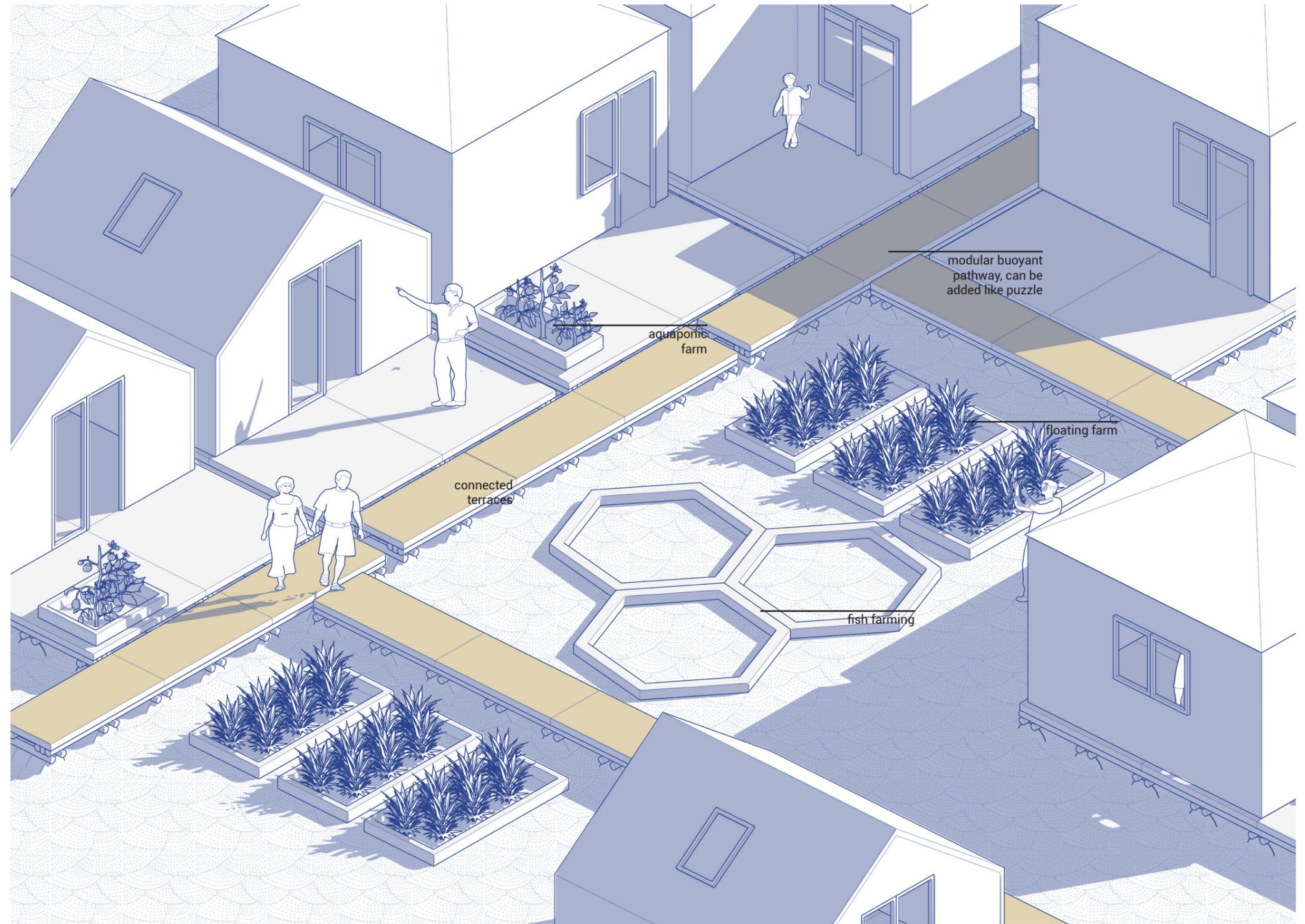
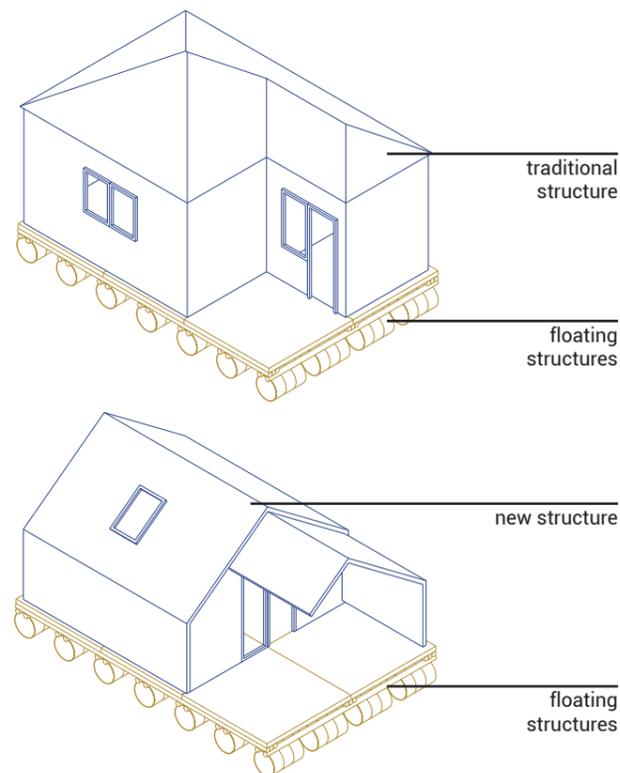
financials

credits (SSB)

advance payment (SBUM)

These banks include PT Bank Tabungan Negara (Persero) Tbk (BTN), PT Bank Negara Indonesia (Persero) Tbk (BNI), and PT Bank Rakyat Indonesia (Persero) Tbk (BRI). Each person gets a payment reduction in the form of interest rate (SSB) of 5 percent per year during the 10-year subsidy period, as for the advance payment (SBUM) of landed houses to be 1 percent.

Current Spatial Condition



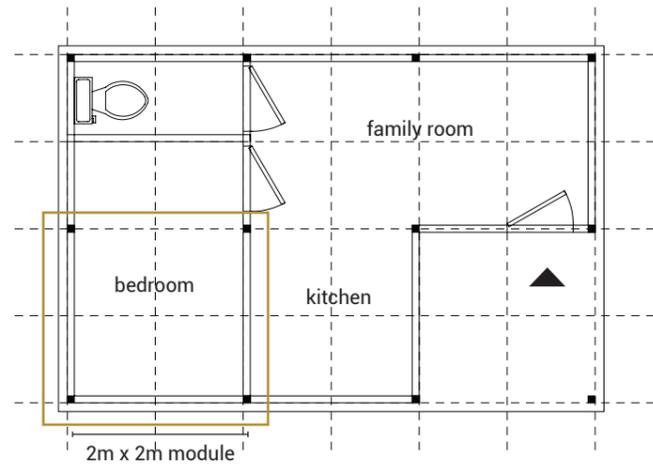
**floating kampung**  
 everyday condition - vision

Single Unit  
**H04-A / Floating House.**

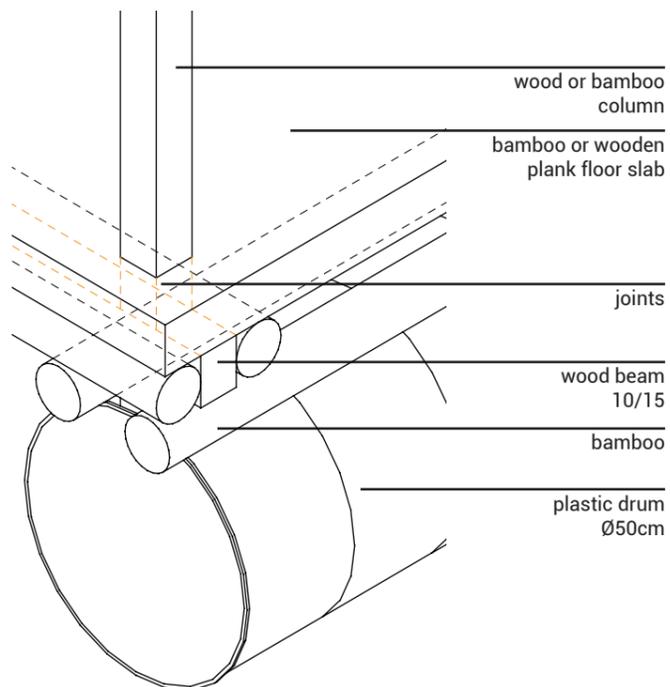
Site

If your house is located on the yellow color on the map, then we urged you to upgrade your house into this scheme or relocate yourself.

Program / Floorplan



Infrastructure



Temporality



With this housing scheme, you can stay longer according to the time phase planning. You can also implement this house idea to another water-related location. (refer to urban relocation planning)

light aluminium roof truss

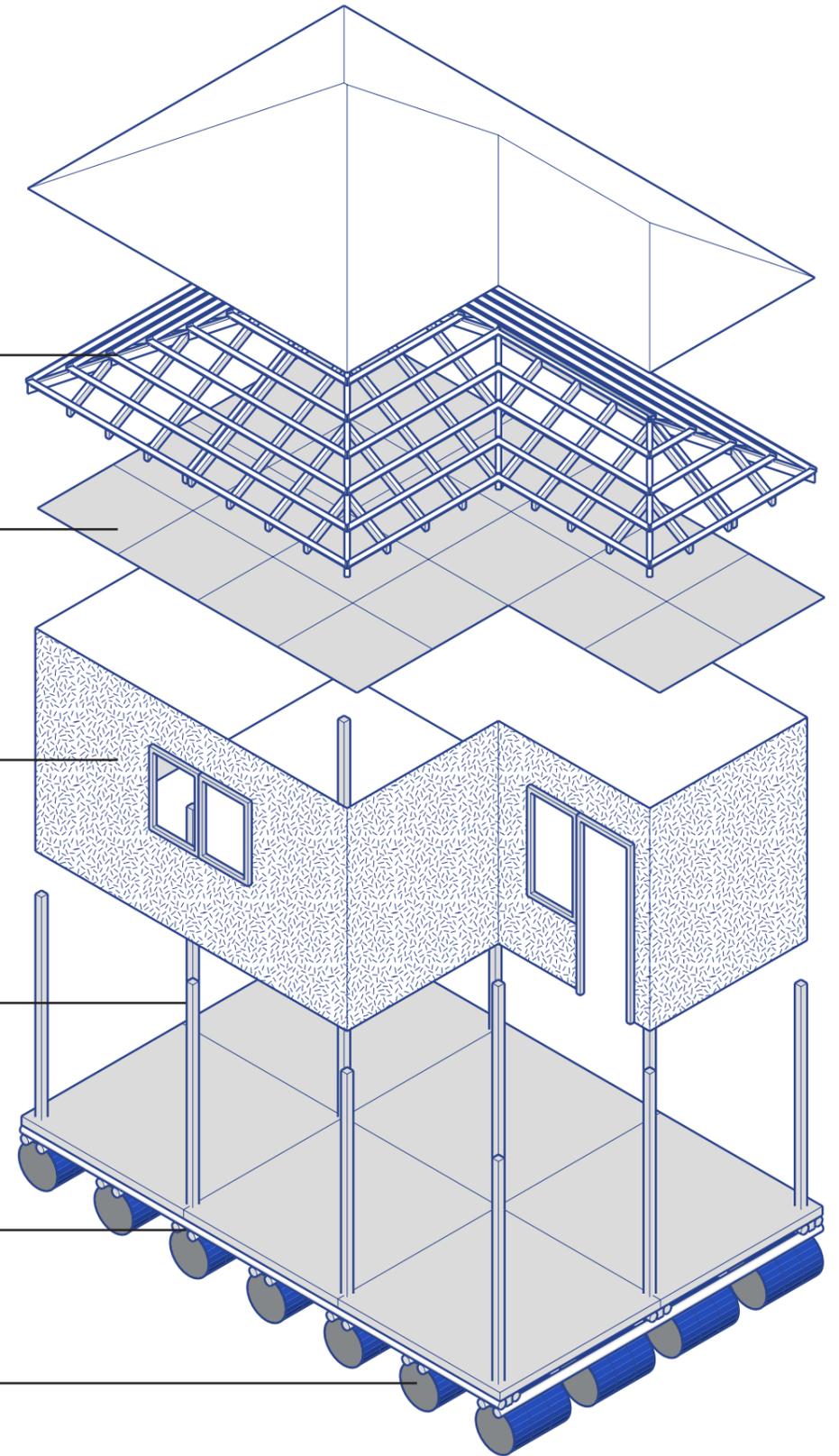
light gypsum

using very light materials, such as transparent fiber or wooden planks

main column using wood or bamboo

drum tied to bamboo structure

plastic drum Ø50cm, lifting house structure, adjusting to water level

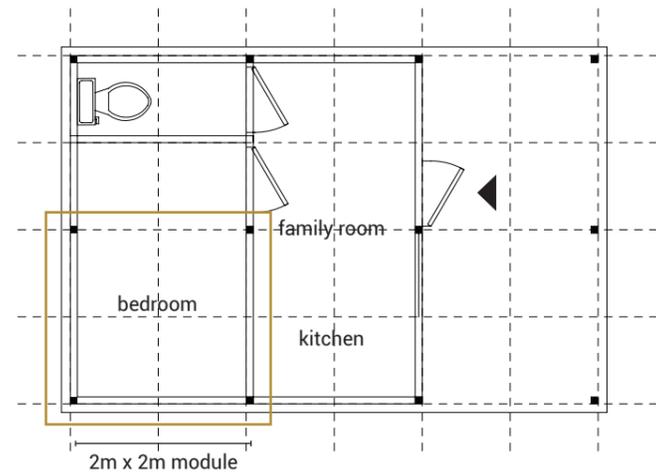


Single Unit  
**H04-B / Floating House.**

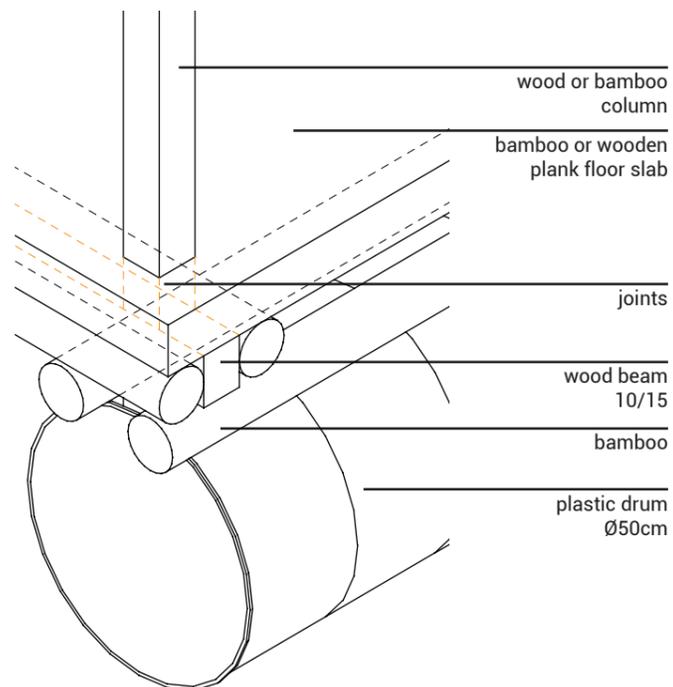
Site

If your house is located on the yellow color on the map, then we urged you to upgrade your house into this scheme or relocate yourself.

Program / Floorplan



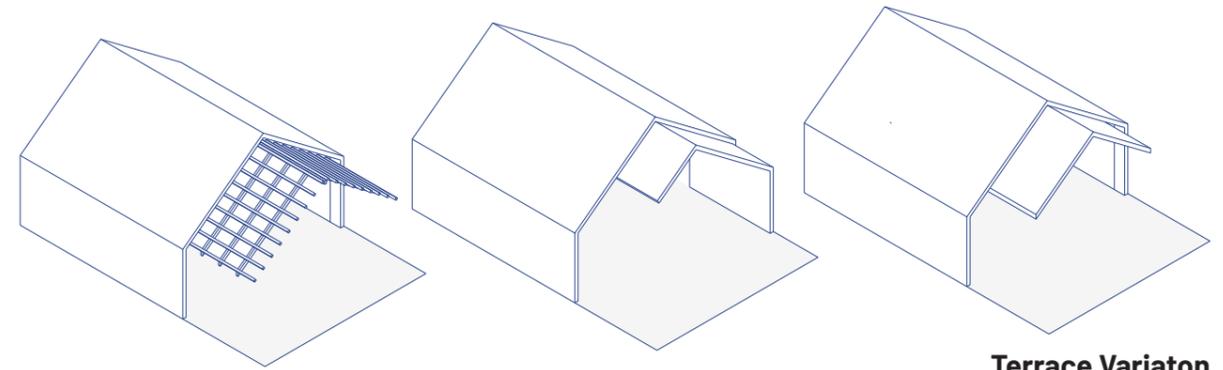
Infrastructure



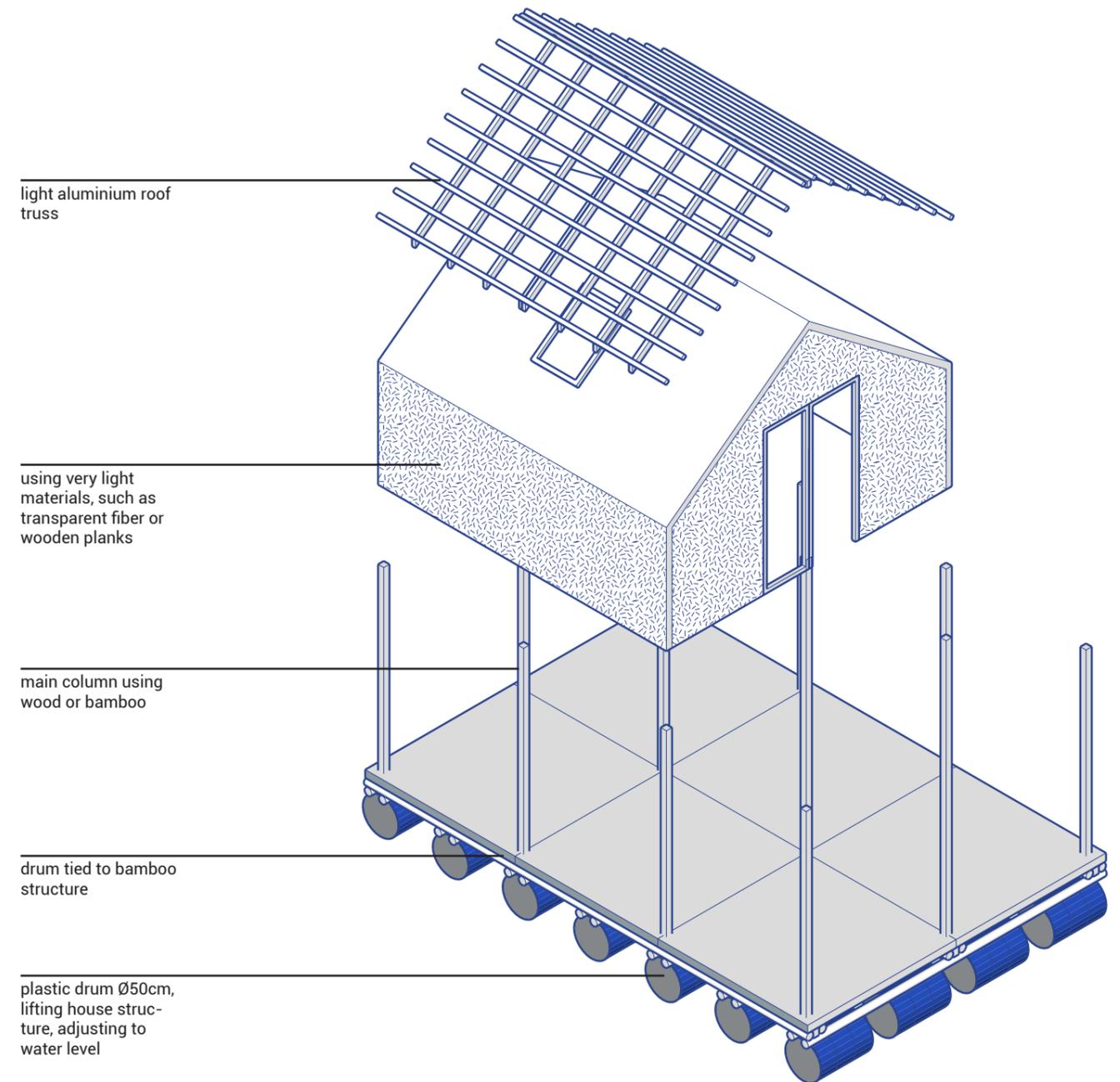
Temporality



With this housing scheme, you can stay longer according to the time phase planning. You can also implement this house idea to another water-related location. (refer to urban relocation planning)



Terrace Variaton



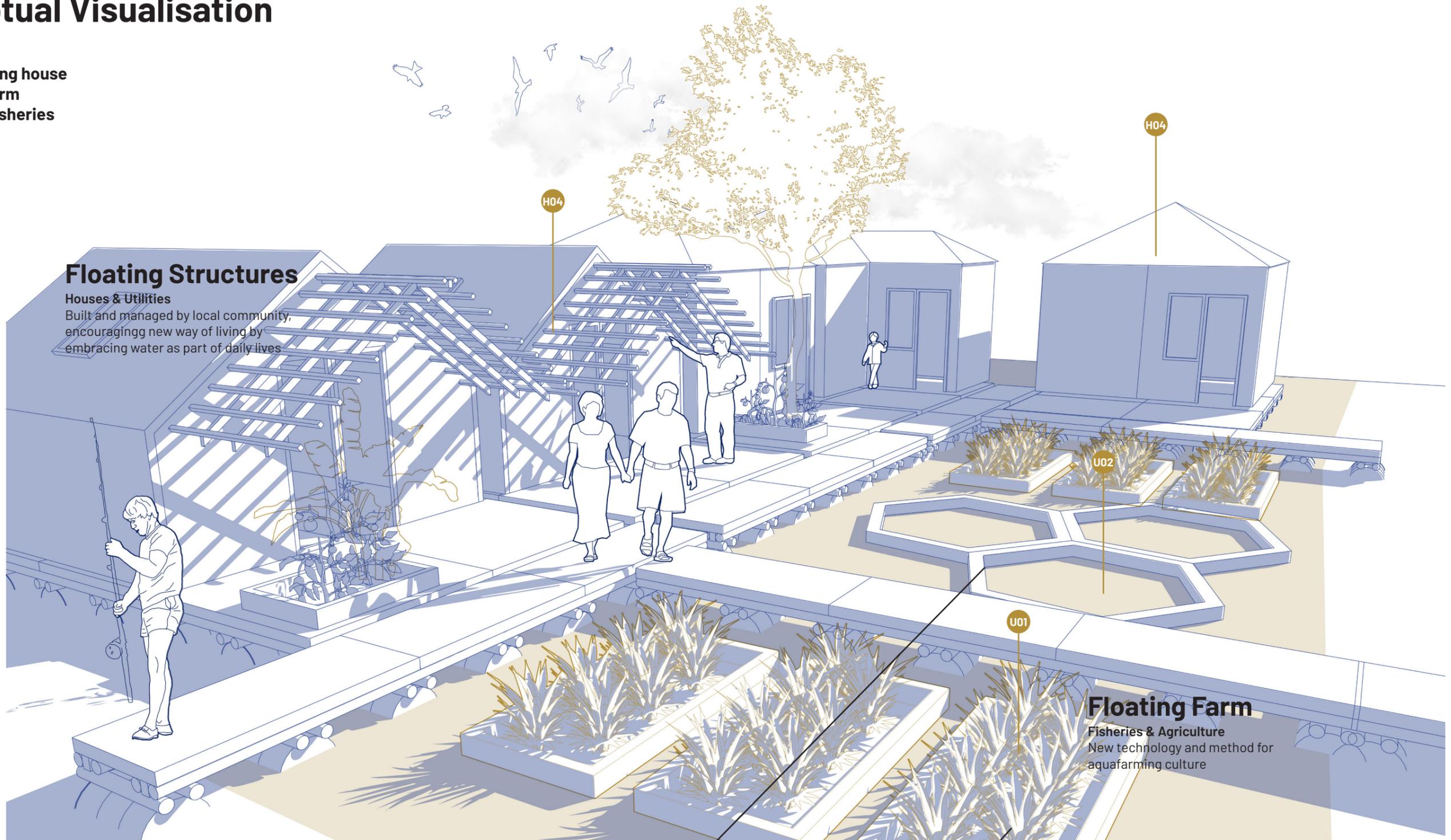
# Conceptual Visualisation

Modular Unit:  
H04 A/B: Floating house  
U01: Floating farm  
U02: Floating fisheries

## Floating Structures

### Houses & Utilities

Built and managed by local community, encouraging new way of living by embracing water as part of daily lives



## Floating Farm

Fisheries & Agriculture  
New technology and method for aquafarming culture

Floating fishfarm with modular system, the water stream will provide oxygen and nutrients for the fish from the plants.

Floating planting media, the root grows into the water, getting nutrients from the fisheries farm nearby and flowing water.

Single Unit/Compound  
**H05 /Vertical House.**

Description Code / H05

The vertical house allows you to stay longer on your current location. If you want to live close to the water you can choose this housing structure with cheap local materials (provided by other communities). This system allows you to have more expansions in the future and even connect your house to your neighbors. Placement of the housing can be seen on right picture.

**Incentive Schemes**

Cost: 20 -25 million  
 Funding Scheme:

**INCENTIVES**



financials

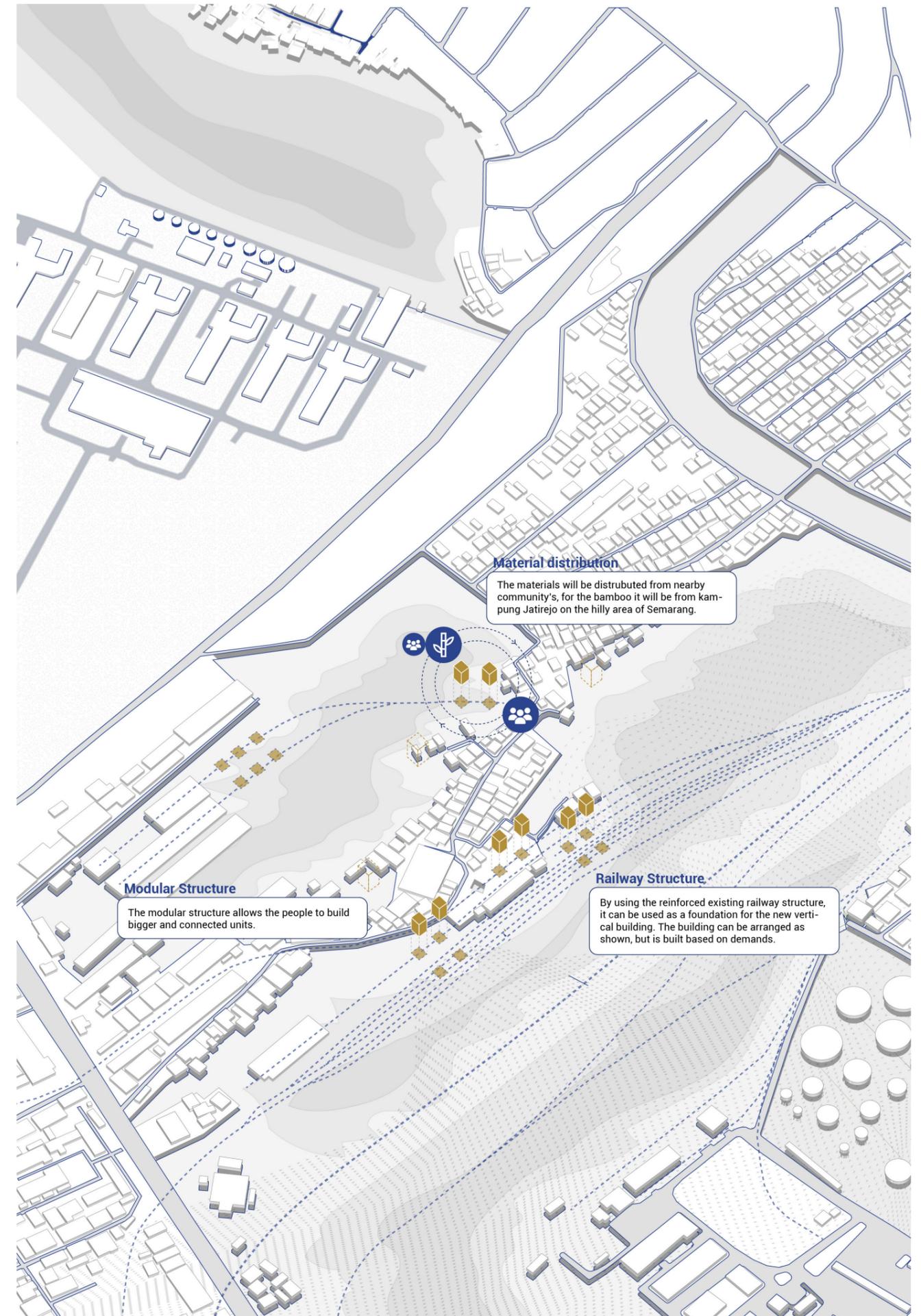
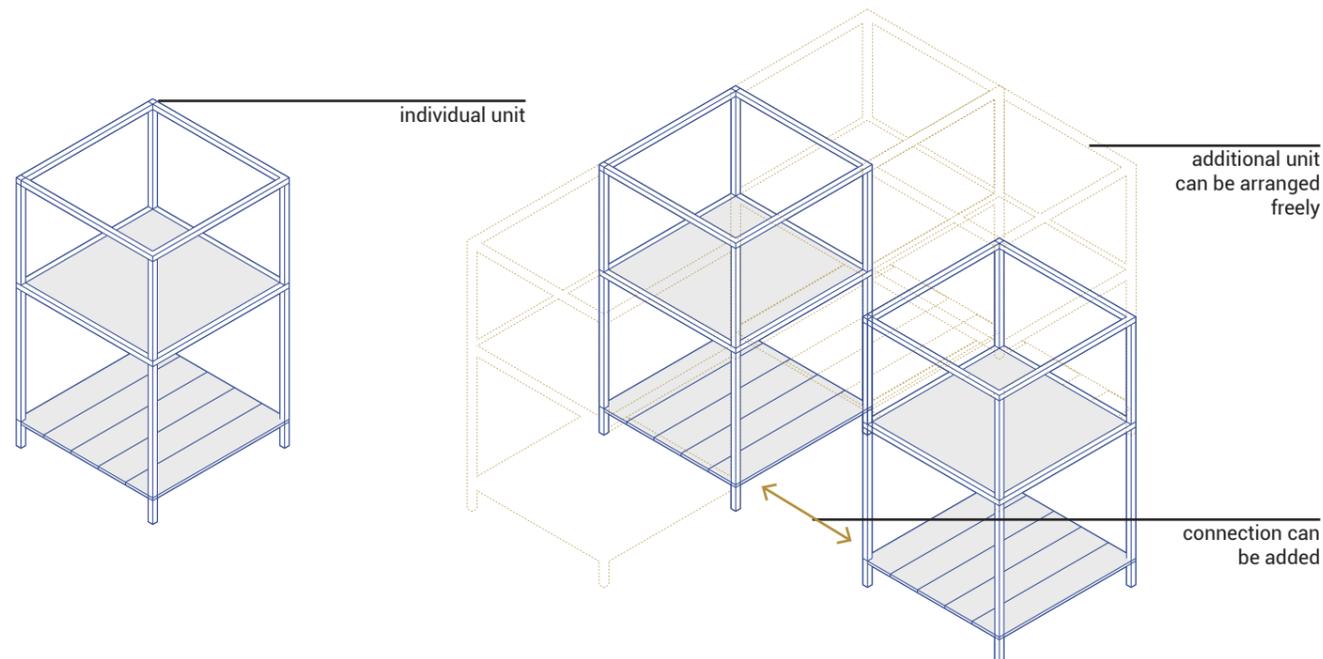
credits (SSB)

advance payment (SBUM)

These banks include PT Bank Tabungan Negara (Persero) Tbk (BTN), PT Bank Negara Indonesia (Persero), Tbk (BNI), and PT Bank Rakyat Indonesia (Persero) Tbk (BRI). Each person gets a payment reduction in the form of interest rate (SSB) of 5 percent per year during the 10-year subsidy period, as for the advance payment (SBUM) of landed houses to be 1 percent.

**Modular Structure**

The modular structure allows you to have more expansion in the future. These expansion can also allow you to integrate your building to other vertical building structure.



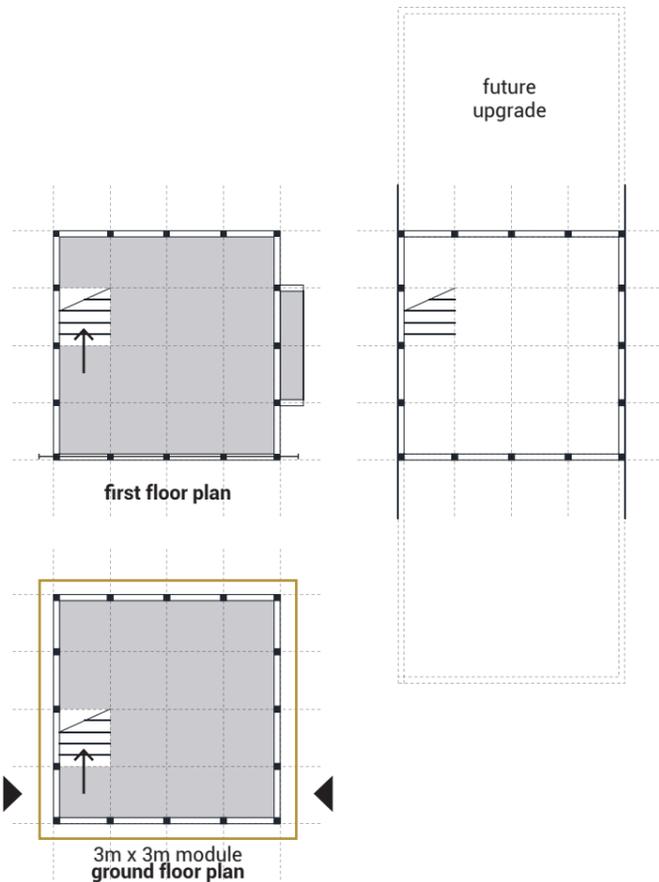
Single Unit/Compound  
**H05 /Vertical House.**

Modular Functions

We urged you to have an empty space on the ground level for supervisions and for gathering space which can be used by the neighbors as well. These space can be flooded during wet and high rainy season as well. But it is your freedom to choose wisely on the space functions.



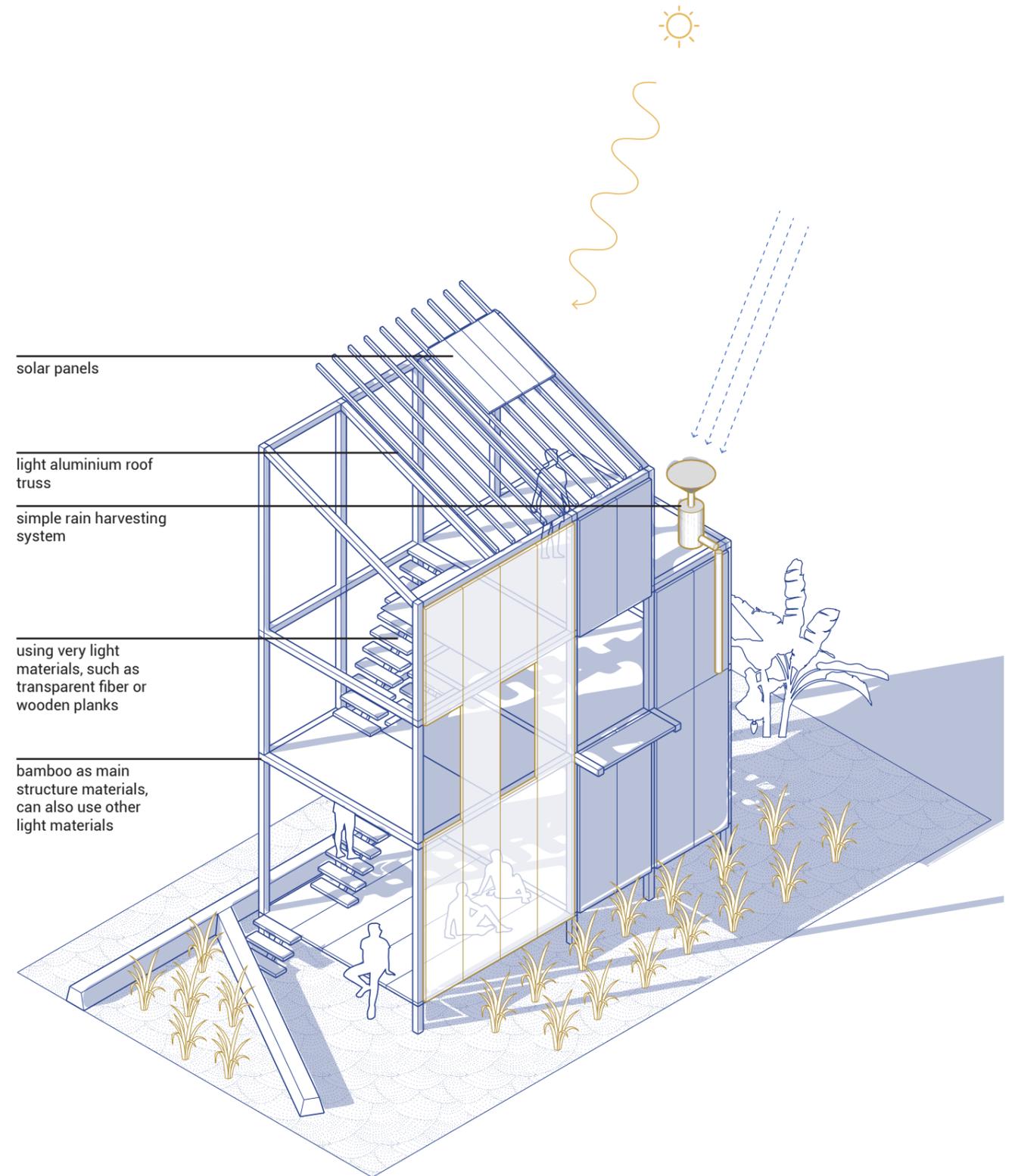
Program / Floorplan



Temporality



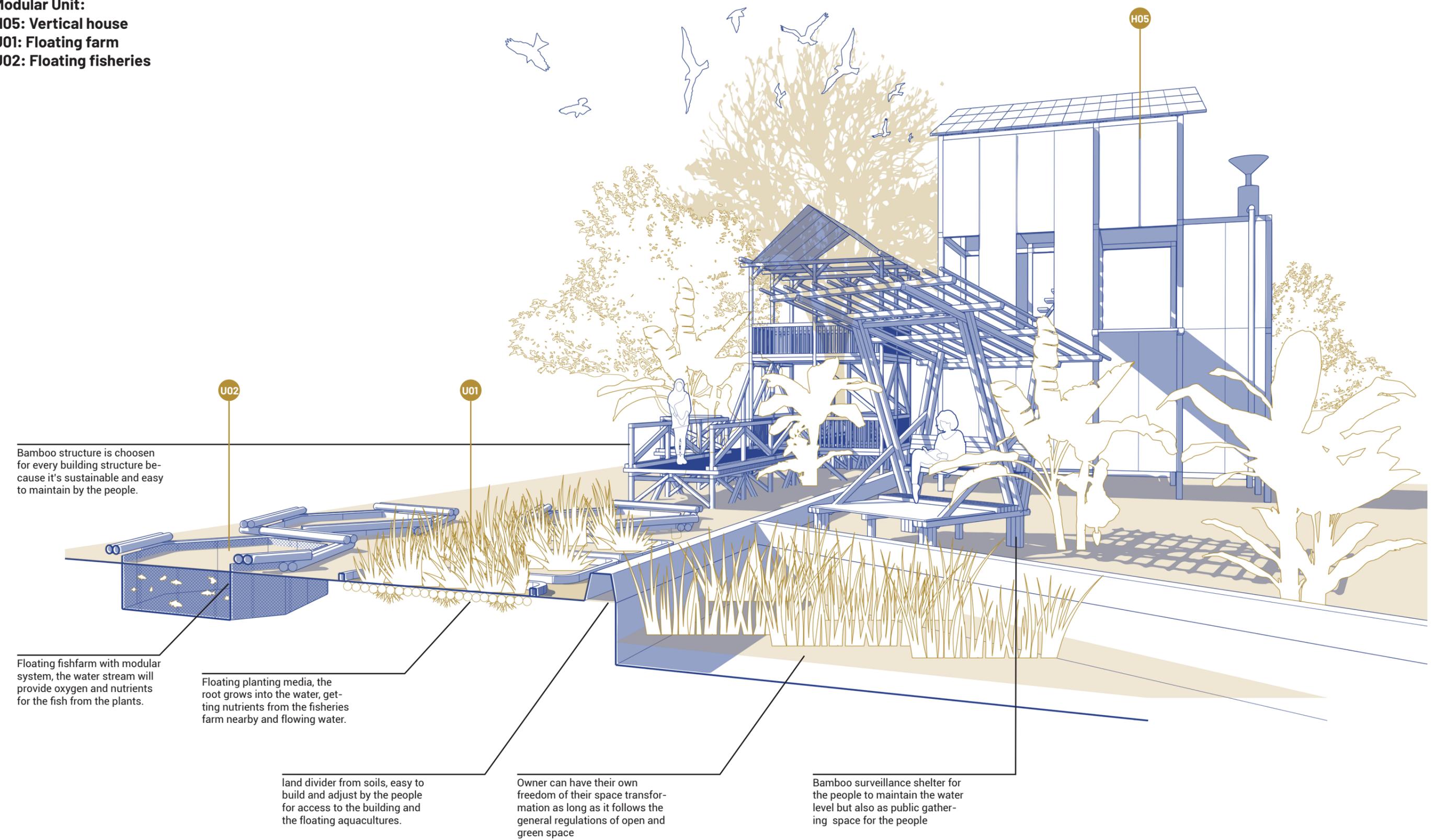
With this housing scheme, you can stay longer according to the time phase planning. You can also implement this house idea to another water-related location. (refer to urban relocation planning)



Possible Unit Personalisation

# Conceptual Visualisation

**Modular Unit:**  
**H05: Vertical house**  
**U01: Floating farm**  
**U02: Floating fisheries**



Bamboo structure is chosen for every building structure because it's sustainable and easy to maintain by the people.

Floating fishfarm with modular system, the water stream will provide oxygen and nutrients for the fish from the plants.

Floating planting media, the root grows into the water, getting nutrients from the fisheries farm nearby and flowing water.

land divider from soils, easy to build and adjust by the people for access to the building and the floating aquacultures.

Owner can have their own freedom of their space transformation as long as it follows the general regulations of open and green space

Bamboo surveillance shelter for the people to maintain the water level but also as a public gathering space for the people

## .03 Relocation

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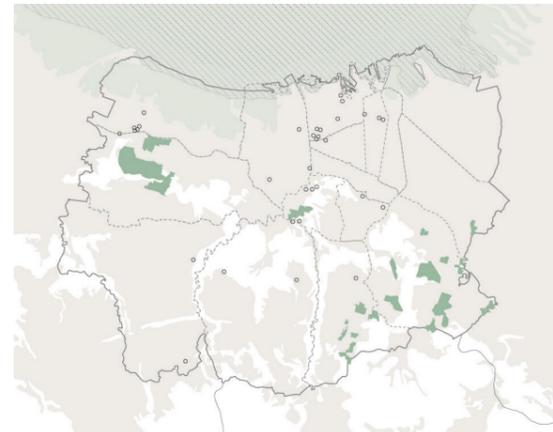
In this section, will be explained the adaptive re-use strategies which can be implemented by using the existing building structure

**Compound Unit**  
**C01 / Perumahan 01**

Description Code / C01

We offer new housings close by the coastal areas, you can have new housing incentives and subsidies. Each unit will own legal land ownership. See incentive part for more details.

**Siteplan**



(Top) Other locations are also offered for those who seeks for new environment, these locations have been carefully selected with approximate distance to new job opportunities.

(Left) One example of site location with approximate distance to coastal areas for those who are willing to seek for safer areas but close to their jobs or those who works on the industries.

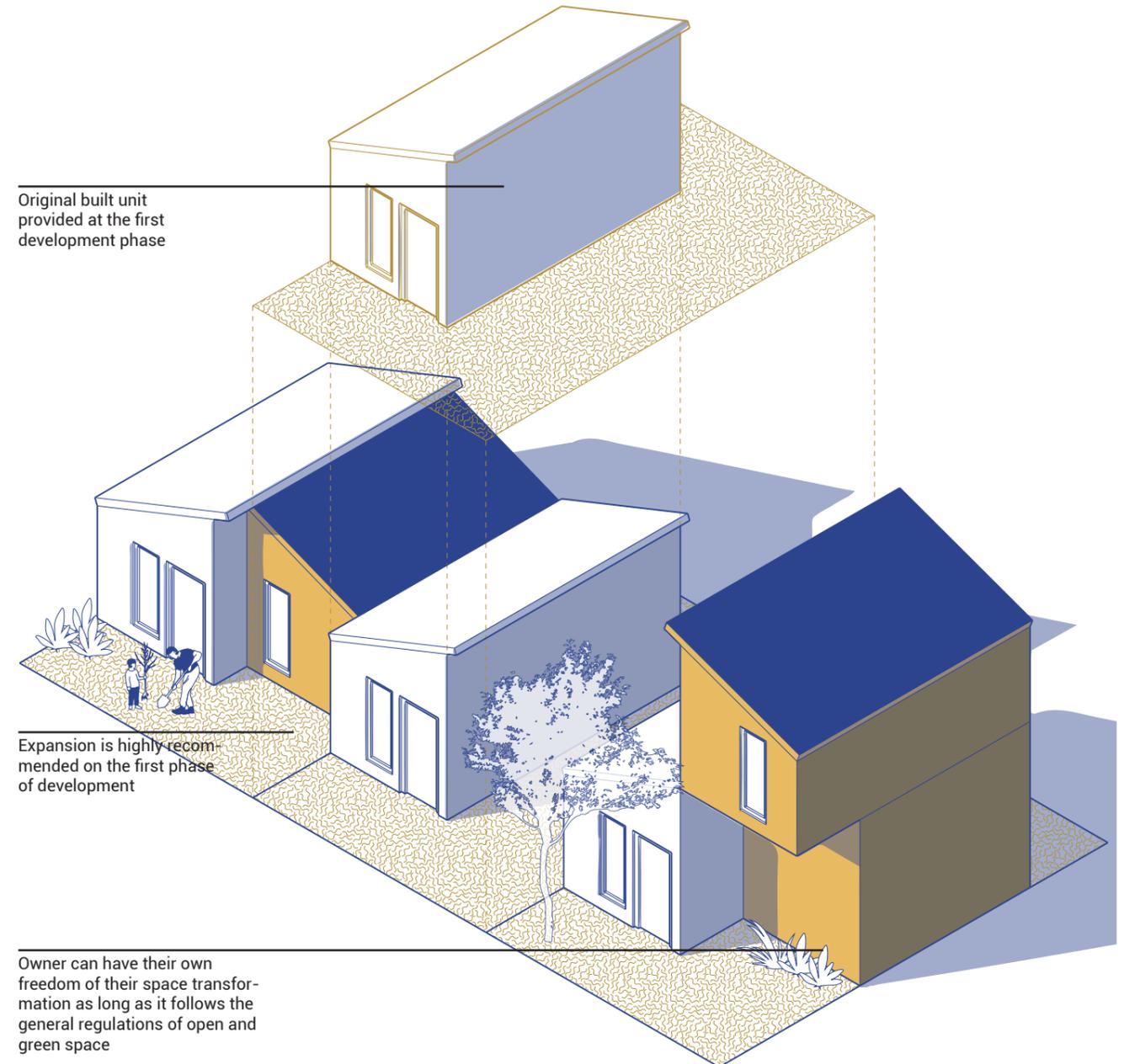
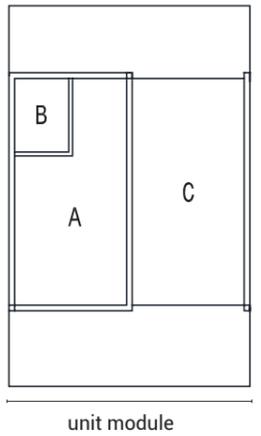
**Temporality**



You can have your own legal land ownership with the incentive scheme, by paying your monthly cost with the agreed percentages of ban credits negotiation.

Each unit will own 6x6m lot size, where half of it is already built and the rest can be built upon their freedom. Each owner is urged to build their extensions for open and green spaces to allow natural water absorption but also healthier environment.

- Legends:  
A. Family room  
B. Bathroom  
C. Further Expansion



## Compound Unit C01 / Perumahan 01

### Masterplan

The units will be arranged as shown on the right image, each cluster will be divided into smaller clusters which consists of maximum 20 units surrounded by pocket parks and connected by the parks along the ditch. Each cluster will have one prayer building that can be used as gathering space by the community. Each cluster will have kiosk rented for the community.

### Incentive Schemes

Cost: 30 - 50 million  
Funding Scheme:

#### INCENTIVES



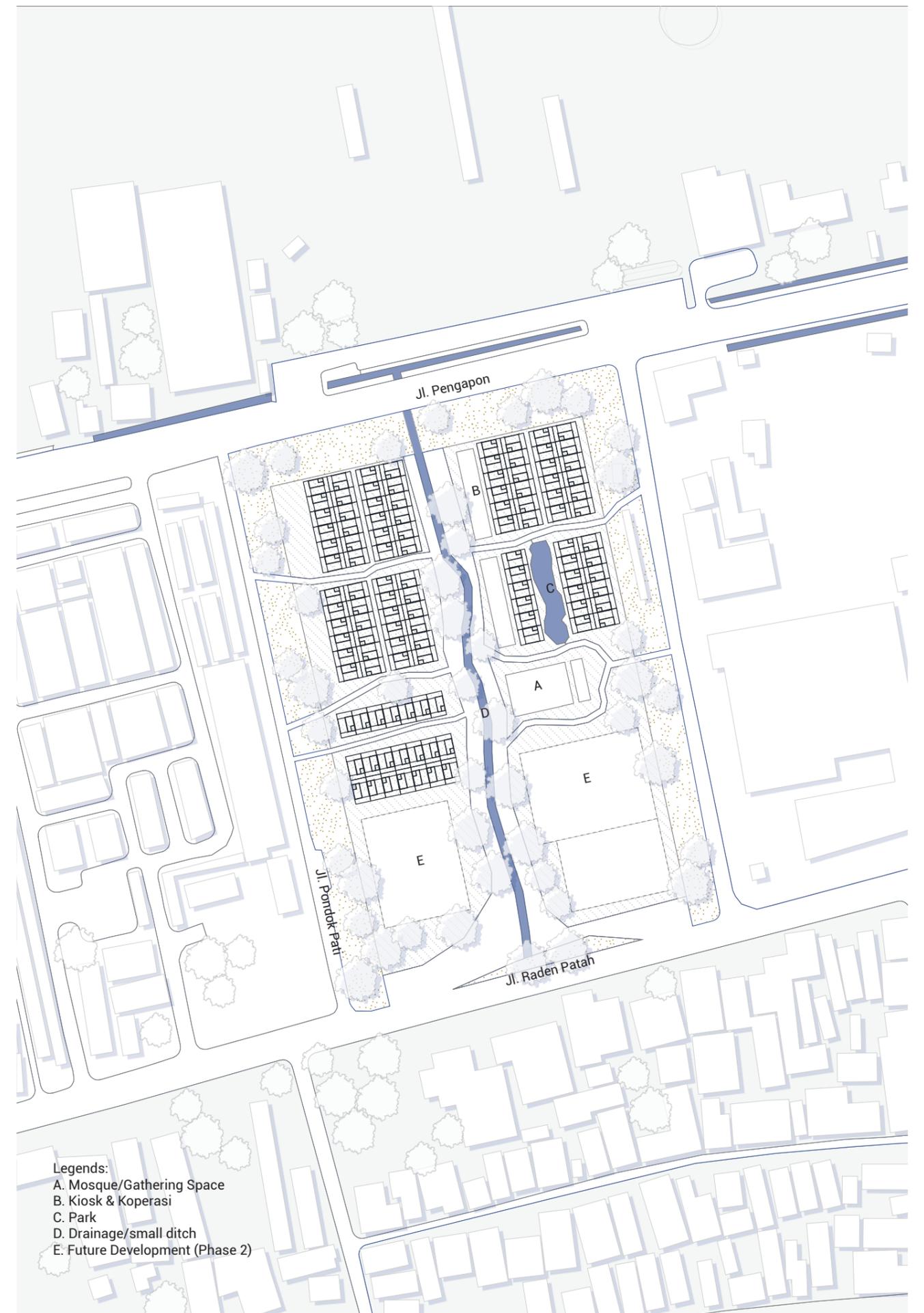
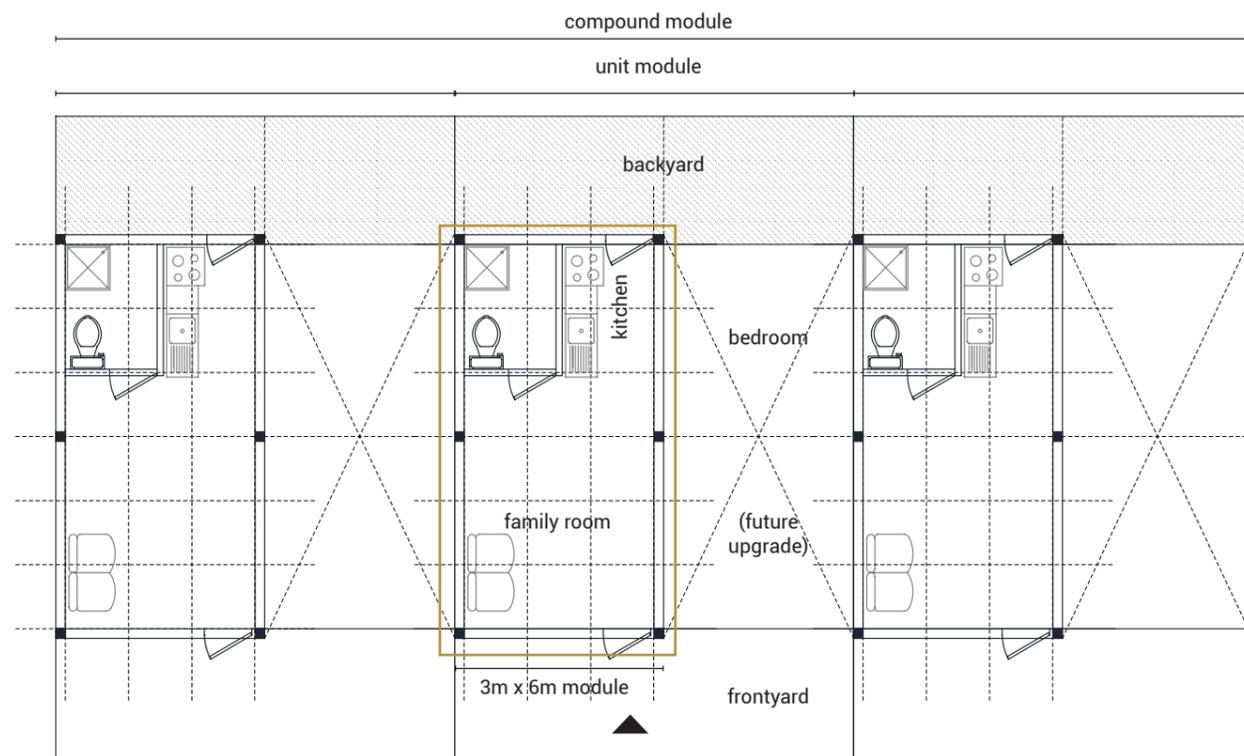
financials

credits (SSB)

advance payment (SBUM)

These banks include PT Bank Tabungan Negara (Persero) Tbk (BTN), PT Bank Negara Indonesia (Persero), Tbk (BNI), and PT Bank Rakyat Indonesia (Persero) Tbk (BRI). Each person gets a payment reduction in the form of interest rate (SSB) of 5 percent per year during the 10-year subsidy period, as for the advance payment (SBUM) of landed houses to be 1 percent.

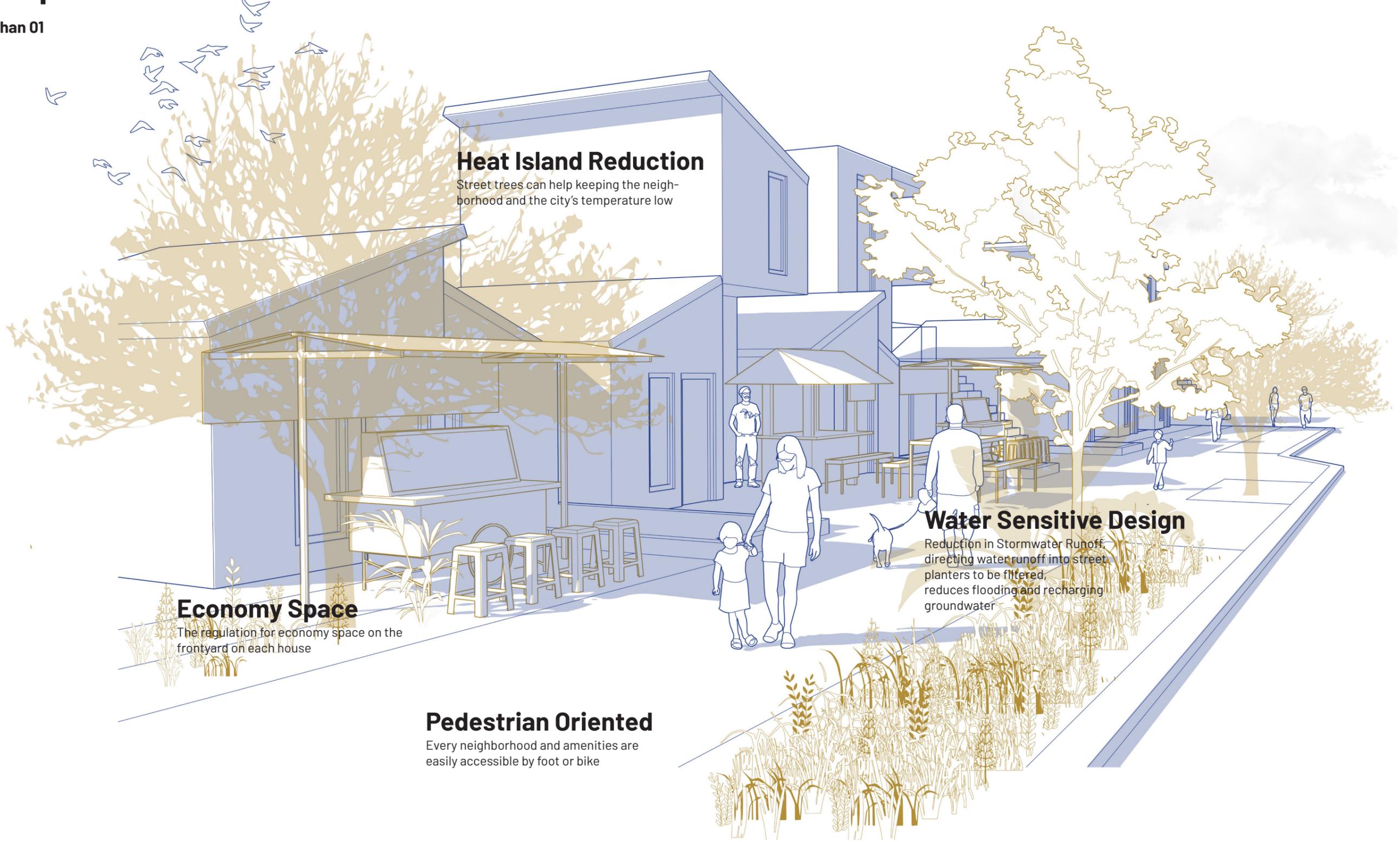
### Floorplan



- Legends:
- A. Mosque/Gathering Space
  - B. Kiosk & Koperasi
  - C. Park
  - D. Drainage/small ditch
  - E. Future Development (Phase 2)

# Conceptual Visualisation

Perumahan 01



## Heat Island Reduction

Street trees can help keeping the neighborhood and the city's temperature low

## Economy Space

The regulation for economy space on the frontyard on each house

## Water Sensitive Design

Reduction in Stormwater Runoff, directing water runoff into street planters to be filtered, reduces flooding and recharging groundwater

## Pedestrian Oriented

Every neighborhood and amenities are easily accessible by foot or bike

## .04 New Utilities System

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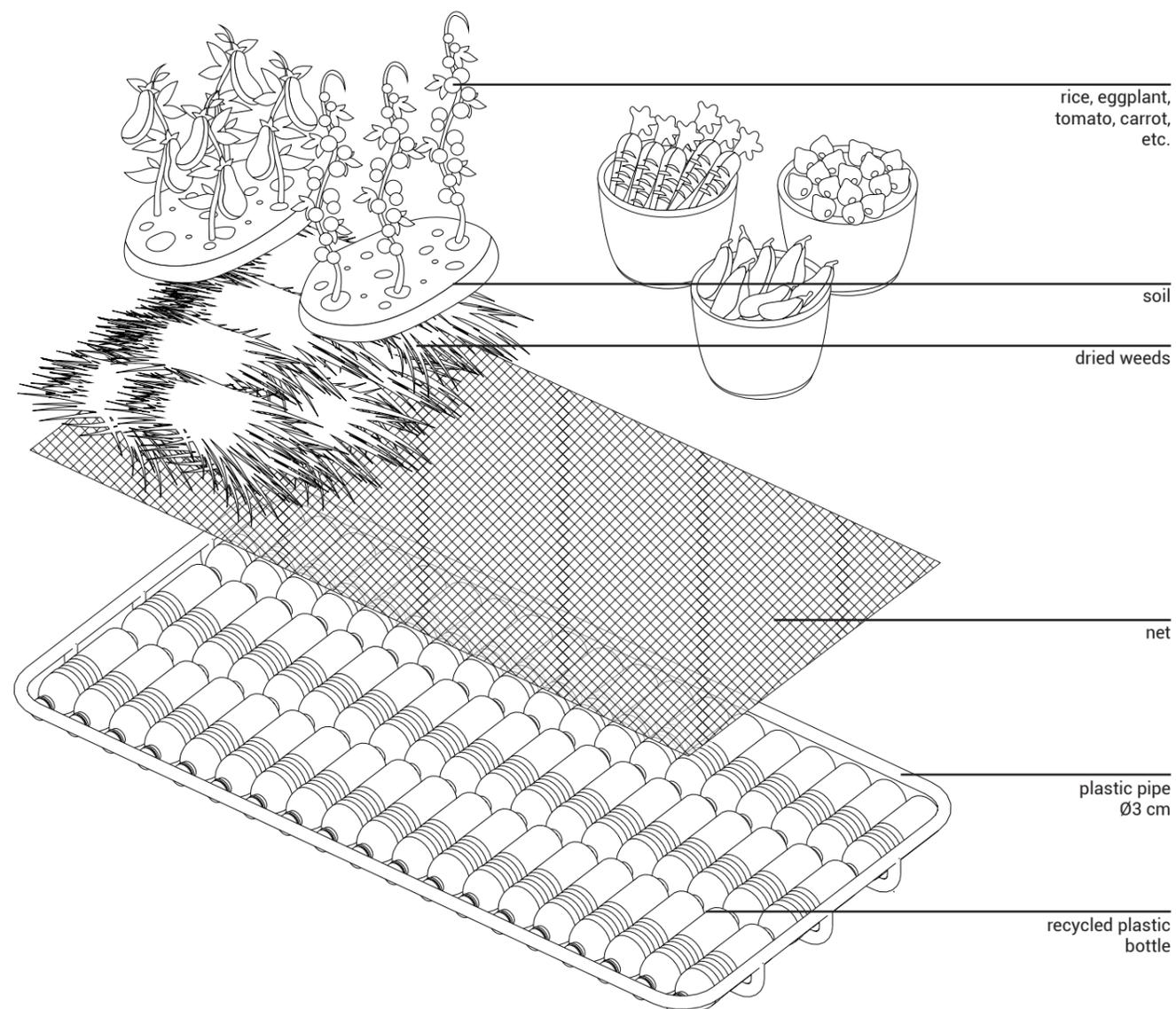
In this section, will be explained the adaptive re-use strategies which can be implemented by using the existing building structure

Single Unit  
**U01 / Floating Farm.**

System & Incentives

The floating farm system is adapted from the existing system. Plants are chosen based on the farmers will. Seeds will be provided by the community through koperasi and product can be sold to the local markets.

Infrastructure



Implemented System

The floating farm will be implemented as follows, the community will maintain the system through koperasi and the benefit will be used as modal for seedings.

The recycled bottle will be distributed by the surrounding's community, as an exchange of the plant products.



**Picture 1 (above).** Settled floating farming can be put into layout as shown, secured to poles to keep it from moving because of the waves.

**Picture 2 (right above).** The example of the floating farming system, people can also use natural fertilizer

**Picture 3 (right below).** The setting of the dried weeds, can be put directly on top of the net and plastic bottle.

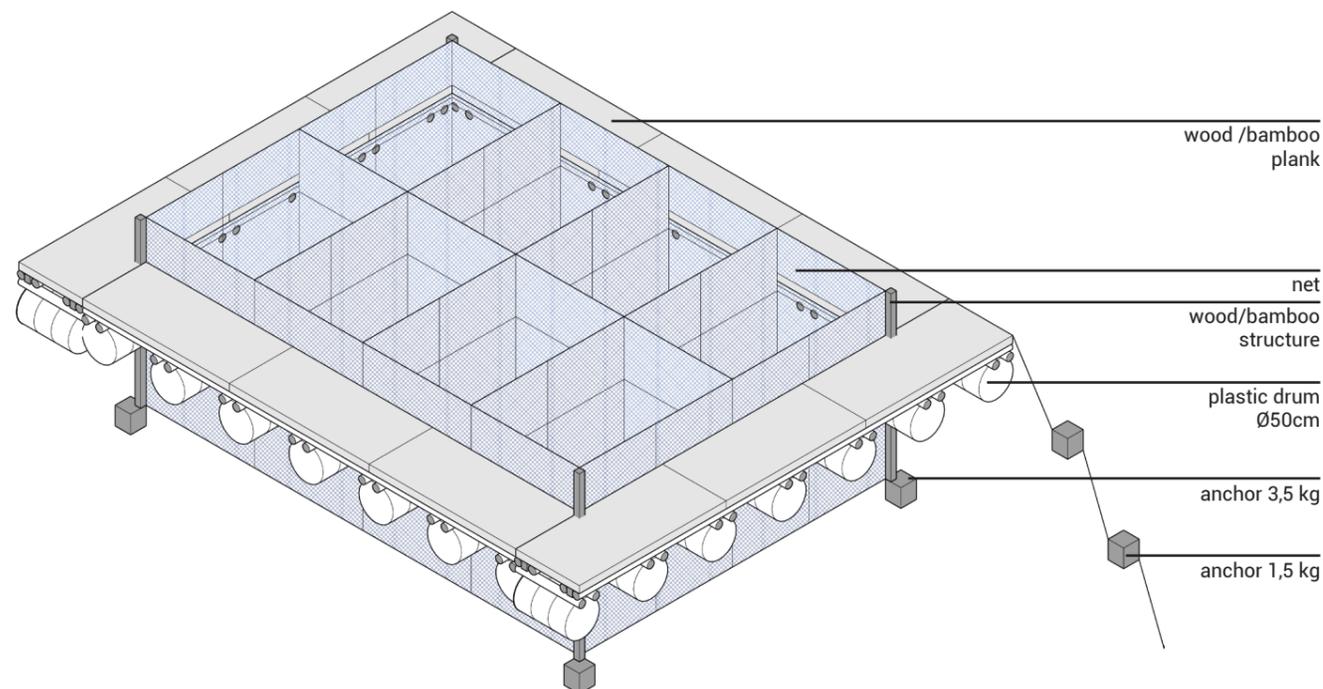
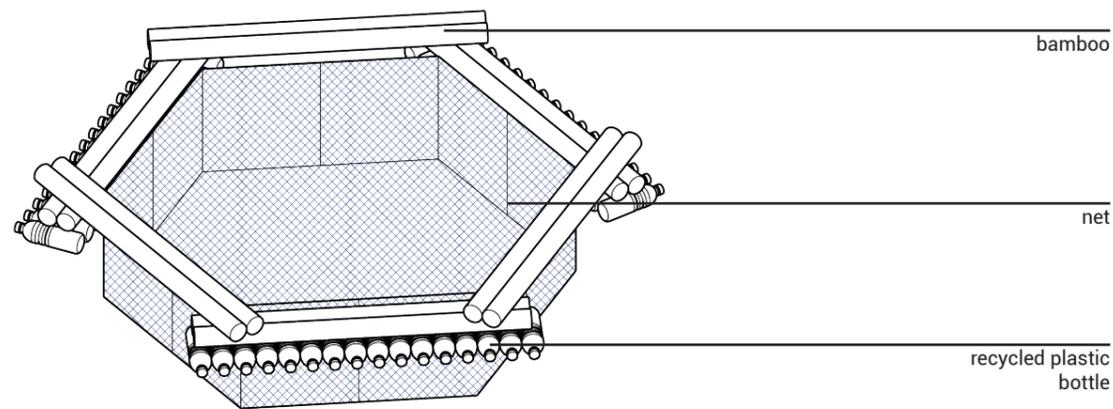
Source:  
 kabartani.com  
 Adaptasi Pola Genangan Air Rawa Lebak Dengan Budidaya Tanaman Padi Mengambang Di Desa Pelabuhan Dalam, Kabupaten Ogan Ilir (Saleh, et. al, (2010))

Modular Unit  
**U02 / Floating Fisheries.**

System & Incentives

The floating fisheries system is adapted from the existing system, keramba (see picture 1). The system then adapted by using the local materials such as bamboo and recycled plastic bottles with net. The first model is suitable for area with smaller water body areas, while the second (below) is suitable for larger water body area which can be maintained by many members in one big structure. The main idea for this system is to allow the people using the land more flexible by using floating structure which only tied to the ground, allowing small movement to ease the maintenance of the land itself.

Infrastructure



Implemented System

The ideas of the floating fisheries system is adapted from the local knowledge of the existing fisheries methods in some of kampung in Indonesia and Fillipine. The idea is to use the water stream of the river and the sea, allowing and providing necessary nutrients for the fish but also without need to create a space for the fish (for example fish pond). This method is relatively cheap and easy to maintain by the people. Each module box can fit many fish for each varieties, possibilities can be based on the owner's creativity.

The proposed module will be very useful for the people who wants to have their own fish farm with smaller scale, while the other model can allow the people to share the structure with the other people. As for the maintenance, the large module can allow the people to have their own system, they can establish small fisheries group/community which responsible for daily/weekly maintenance.

The knowledge is very important, so the assistance from the government (from ministry of fisheries) can help the people and the community. The product of the fish can also be sold to the local market with the help of koperasi and collaboration with the small&medium local enterorise market.



**Picture 1 (above).** Local knowledge of keramba or floating fisheries sytem

**Picture 2 (right above).** The example of the floating fisheries system in Filipine, expanding the possibilities of applying it on salt water too.

**Picture 2 (right bellow).** The example of the floating fisheries system in Waduk Jatiluhur, West Java, allowing the people to create a fisheries farm with the other people, and accessing it with small boats.

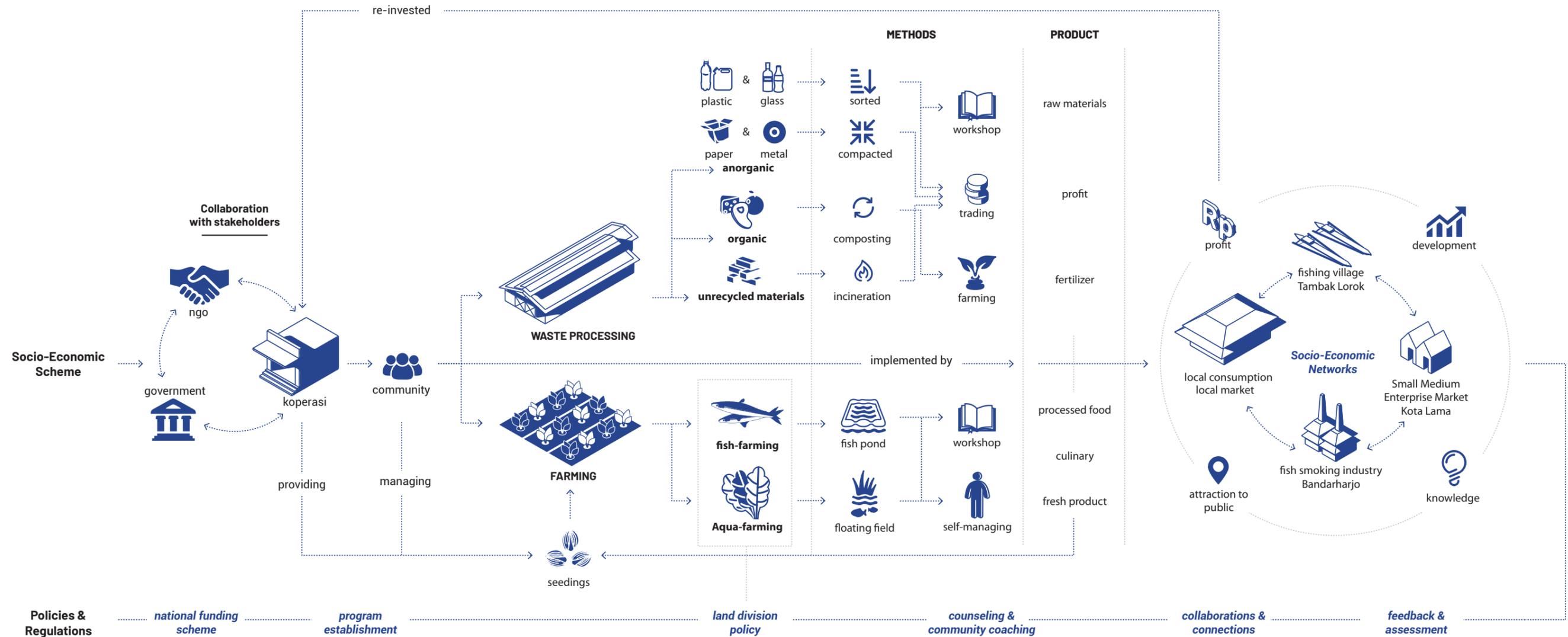
Source:  
<https://aquafishcrsp.oregonstate.edu/small-scale-changes-could-make-long-term-improvements-asian-aquaculture>  
<http://tanday-selatan.blogspot.com/2010/09/memelihara-ikan-patin.html>

# Modular Unit U03 / Socio-Economic Scheme

## System & Incentives

This can be an opportunity for food supply if sustained and distributed well. The idea is to expand the production to the local market but also to the small & medium enterprise market nearby. Not only selling the processed product, the fish (raw product) from the local fishfarming can also be traded to the nearby fish smoking industry. If the supply of the raw fish is insufficient, the people can get their supply from the nearby market or from the fishing village in Tambak Lorok, establishing new socio-economic connections between the local communities.

## Schemes



**national funding scheme**  
regulation regarding:  
1. kampung funding (Dana Desa)  
2. Local Income (Pendapatan Asli Daerah)  
3. Other Income (Pendapatan lain-lain)

**program establishment**  
On Sub-district level to community  
1. Regulations of Dana Desa  
2. Regulations kampung program development  
  
From community:  
1. Planning and Budgeting = proposal  
2. Program phasing

**land division policy**  
Regulations of land ownerships:  
1. Kampung land ownership (Tanah kas desa)  
2. Collective land ownership (Tanah bersama (dimiliki oleh pemerintah/stakeholder) - disewakan)

**counseling & community coaching**  
Regulations of workshop and knowledge sharing:  
1. Collaboration with regional services  
2. Collaboration with universities

**collaborations & connections**  
1. Rules regarding cooperation between the closest communities  
2. Regulations regarding cooperation with the nearest public facility  
3. Regulations regarding socio-economic networks

**feedback & assessment**  
Output generalisation and feedback, assessment

